Lockstep Variations

for ensemble and electrified snare drums

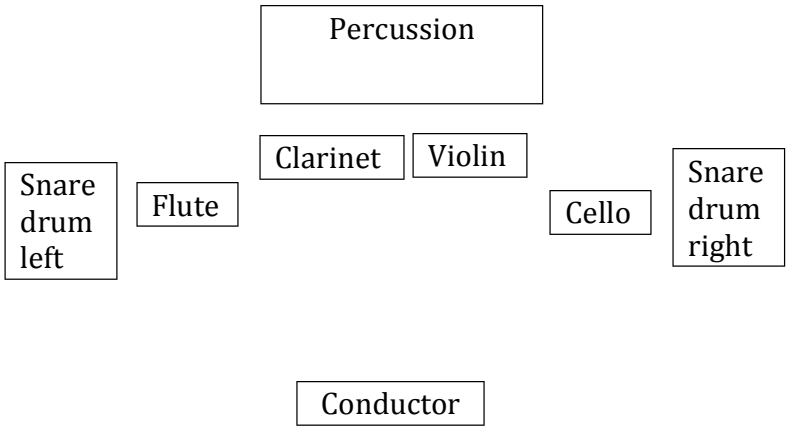
to the New York New Music Ensemble

◆

2018

Benjamin Hackbarth

Stage Setup



Required Materials

• Two electrified snare drums (instructions for preparing the drums can be found at the end of the score notes).

• An amplifier for the snare drum speakers (specifications at end).

• Amplification of the flute.

• Amplification of the rest of the insturments is optional. However it is required in a large hall or very reverberant space. The snre drum do not need to be amplified.

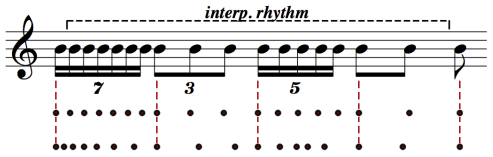
• A headphone amplifier and earpiece for the conductor's clicktrack.

• Three channel playback. The soundfile is avaible from the composer. Channel 1 is snare drum left, channel 2 is snare drum right, then the click track on channel 3.

Notation

<> - A surge in amplitude. Somewhat like accent except that there is a short crescendo before the moment of inflection.

"*f*" - Dynamics in quotation marks indicate performative effort, not the loudness of the sounding result. The result will likely be much softer than the dynamic indicates.



- Interpolate Rhythm modifies the performance of written rhythms in a given passage such that the changing speed of attacks is averaged across time. An example is shown to the left. Underneath the symbolic notation are two rows of dots corresponding to individual note attacks. The first line of dots shows the normal performed rhythm. The second row of dots shows the desired result of the "interpolate rhythm" instruction. Such modifications essentially ensure that, rather than an abrupt change in speed, the rate of successive notes is continually modified to achieve a fluid, continuous stream.

Flute Techniques

 - An unpitched noise made by blowing through the instrument. By default, exhale.

 - Half pitch half noise.

 - Tongue Pizzicato. By default, articulated with a 't' syllable, but performed with 'p' if indicated.

 - Tongue ram. Fingered pitch with sounding pitch shown in parenthesis.

 - Inhale (an upbow symbol). Always with the embouchure hole closed.

 - Key click with the specified pitch.

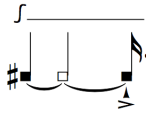
 - Normal lip/embouchure position.

 - Flute turned somewhat inwards.

 - Flute turned inwards as much as possible while still being able to produce sound.

 - Flute turned somewhat outwards.

 - Flute turned outwards as much as possible while still being able to produce sound.

 - Consonants written above the staff indicate to add unpitched sound to articulate and sustained events. Vowels indicate to change the shape of the oral cavity to alter the tone color. Both consonants and vowels are written in the International Phonetic Alphabet, summarized in English in the table below.

p = pants	t = tie	ʃ = shoe
s = sock	f = feet	a = father
i = fleece	u = goose	ʊ = put

Clarinet Techniques

 - An unpitched noise made by blowing through the instrument. By default, exhale.

 - Slap tongue. Written duration is insignificant.

 - Inhale (an upbow symbol).

 - Ordinario oral cavity.

 - Constricted oral cavity.

String Techniques

SP/MSP - Sul Ponticello/Molto Sul Ponticello

ST/MST - Sul Tasto/Molto Sul Tasto

CL Bat - Col Lengo Battuto, played by bouncing the wood of the bow against the string(s). Almost always with a muted notehead (below).

 - Mute strings with the L.H. resulting in a mostly unpitched sound. Both L.H. pressure and bow pressure are relatively light. Register corresponds to ordinario left hand placement on the string(s) indicated. When performing techniques like col legno battuto and col legno tratto, differences in register should be made more pronounced by varying vertical bow placement in addition to that of the L.H. – more SP for higher notes and more ST for lower notes.

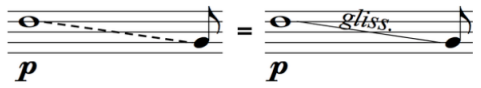
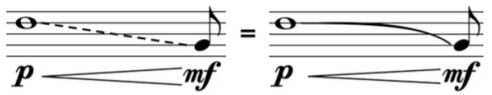
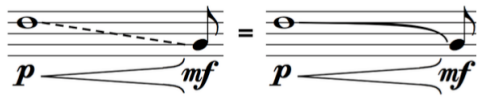
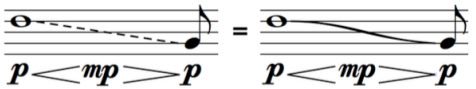
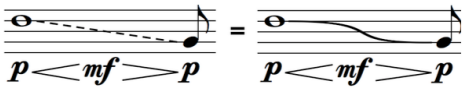
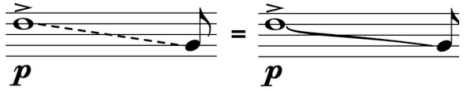
 - Scratch Tone – high pressure and slow bow speed. Use L.H. muting to avoid pitched resonances. The additional instruction "on binding" indicates to play behind the bridge on the thread wound around the string.

 - Forcefully slap the strings on the fingerboard with the left hand.

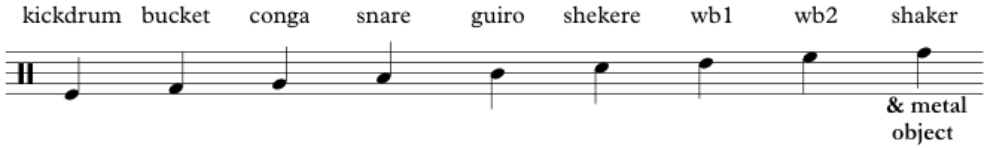
 - A Bartok pizzicato.

 - Bow/pizz directly on the bridge. A completely pitchless sound. Use L.H. muting to avoid pitched resonances.

Glissandi notated with a dotted line indicate that the rate of pitch change is coupled to the changing amplitude of the note. Thus, louder dynamics result in a faster glissando speed while softer dynamics indicate a slower glissando. As dynamics change, the speed of glissando should change in tandem. Consider the following examples that illustrate this coupling:

1. A static amplitude yields an even glissando, equivalent to an ordinary glissando.	
2. However, a change in dynamic affects the slope of the glissando. In this case, the dynamic increase from p to mf create a steeper pitch change towards the end of the note.	
3. The slope of the change in dynamic affects the slope of the glissando. Here, the exponential hairpin creates a more dramatic pitch change when compared to 2.	
4. The intensity of dynamic change also affects the intensity of the glissando speed. A change from p – mp only creates a slight change in glissando slope...	
5. while a change from p to mf yields a more dramatic slope in pitch change when compared to **4**.	
6. Any change in amplitude, however slight, affects glissando speed. shown here, an accent.	

Percussion Instruments



kickdrum: a small kick drum slightly dampened

bucket: a large 20L plastic paint bucket mounted on a drum stand

guiro: wooden guiro

shekere: Play with a mallet. The instruction "beads" indicates to play on the beaded portion. "Wood" indicates to play on the part without beading.

wb1, wb2: unpitched woodblocks, low and high.

shaker: a small shaker that can be played with a mallet.

metallic object: a circular cymbal-like object dampened on a table. Only used once in m. 328

texture sticks: sometimes called "rhythm sticks", these are thick wooden dowels with spiraled groves running their entire length. Composer can provide.

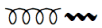
Percussion Techniques

 - Staccato performed as a deadstroke.

 - Play on the rim of the instrument

 - Rimshot

 - A tremolo produced with the stick in constant contact with the instrument – after the initial attack, the stick should not leave the surface. The tremolo is created by rapidly moving the stick back-and-forth as fast as possible in a small area. Accents and dynamics are created by expanding/contacting the area and changing the size of the motion.

 - Make circular motions of the object with the specified implement. The implement should remain in contact with the surface of the playing object over the course of the note's duration. In an unmetered tremolo, as fast as possible. If repeated attacks, each note is a single circular motion.

 - A dashed slur indicates a single gesture where the attacking implement (first note) remains depressed and then a release (second note) is created from an energetic and noisy gesture scraping the articulative implement off of the instrument.

Performance Note D Produce sounds by turning on and off the snares. The "snares on" sound will naturally be much louder than "snares off" – try to mitigate this and make the two sounds equal volume. For "snares on" try to not close the lever all of the way in order to get a slight ricochet effect where the snares bounce against the membrane.

Performance Note H Throughout the next few minutes of the piece you form a "trio" with the two electronic snare drums. This trio is made by abruptly passing sounds between the different drums. There are never any rests or gaps in sound – when you stop playing, one of the snare drums picks up your timbre. When the snare drums stop, you should be playing. At higher dynamics the sound should link up and volley back and forth across space.

Performance Note Q Play this entire section of music with two texture sticks. Use the texture stick shafts for tremolos and the ends for performing attacks. When the music becomes less active you may switch to better sounding articulate mallets at your discretion.

The following notations are used for the texture sticks in this part:

• Single note (non tremolo): play a normal attack with the end of the texture stick, much like you would a normal mallet.
• Tremolo note: create sound by slowly moving the shafts of the texture stick vertically against the instrument.
• Tremolo +  : perform as tremolo but swiping the texture stick back and forth rather than vertical continuous motions. Should be

less gritty than the tremolo technique above.

ELECTRIFIED SNARE DRUMS The electronic part of this piece consists of two snare drums with speakers inside and a click track for the players or conductor. You will need the following materials to create the drums:

• 2 snare drums. 13.75 inches in diameter and 6 inches high. I used Yamaha drums with Remo "Emperor X" drum heads. The drums do not need to be the same brand.

• 2 guitar amplifier speakers. 12-inches in diameter, 5 inches high, 8 ohm, at least 70W. I used Bugera "Vintage Guitar Series." The speakers need to have 6 or 8 screw holes around the circumference of the rim as shown in the pictures below.

• Sturdy twine/string.

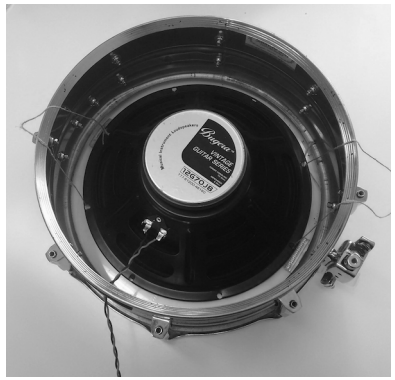
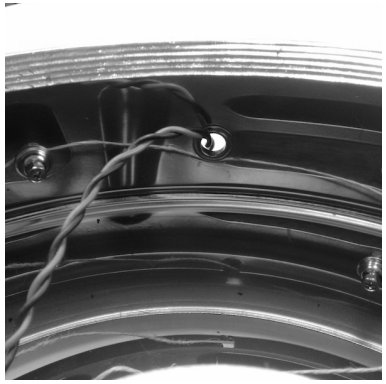
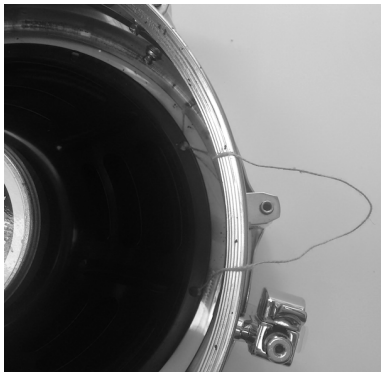
• Stereo amplifier with at least 50 Watts per channel (I used a "Nobsound NS-10G" amplifier that gave plenty of power).

• Speaker wire to cable the on stage snare drums to the amplifier.

1.) Cut two 16 inch pieces of sturdy twine. Thread one piece through two adjacent holes on the rim of the speaker. Make a knot to create a loop. Repeat this process with the second piece of string such that it makes a loop 180º on the opposite side of the speaker.

2.) Remove the top membrane from the snare drum.

3.) Carefully place the speaker cone-side down inside of the drum. Thread the speaker cable through the small hole in the side of the drum's frame. Lay each loop of string over the frame such that each loop falls over a screw hole for securing the membrane to the frame. The two holes should be 180º apart.

5.) Then lay the top membrane back over the drum frame. Partially tighten the two membrane screws that fall inside of the loops of string. Then carefully tug at one loop. The speaker should gently pull away from the lower membrane. Repeat with the other side. The speaker should now hang inside the drum. Gently jiggle the drum side to side. The speaker should swing inside the drum without rubbing against the bottom membrane. The speaker should be as close as possible to the lower membrane without touching it.


7.) Fully tighten the 2 screws with string loops, then the remaining screws. The upper membrane does not need to be fully taught, you only need to secure the strings and make a closed cavity.

8.) Repeat this process for the second snare drum.

9.) Place snare drums on the stage connect the speaker cables to the amplifier (offstage) with speaker cable. Tape that shit.

10.) Use the "calibrate drums" soundfile to set the volume of each drum. They should sound almost identical to each other in terms of timbre and be of equal volume when listening to the calibration soundfile.

Thank You

Thank you to the following researchers whose insights and ideas have inspired and enabled my work: Norbert Schnell, Joachim Goßmann, Arshia Cont, Diemo Schwarz and Philippe Esling.

For the New York New Music Ensemble

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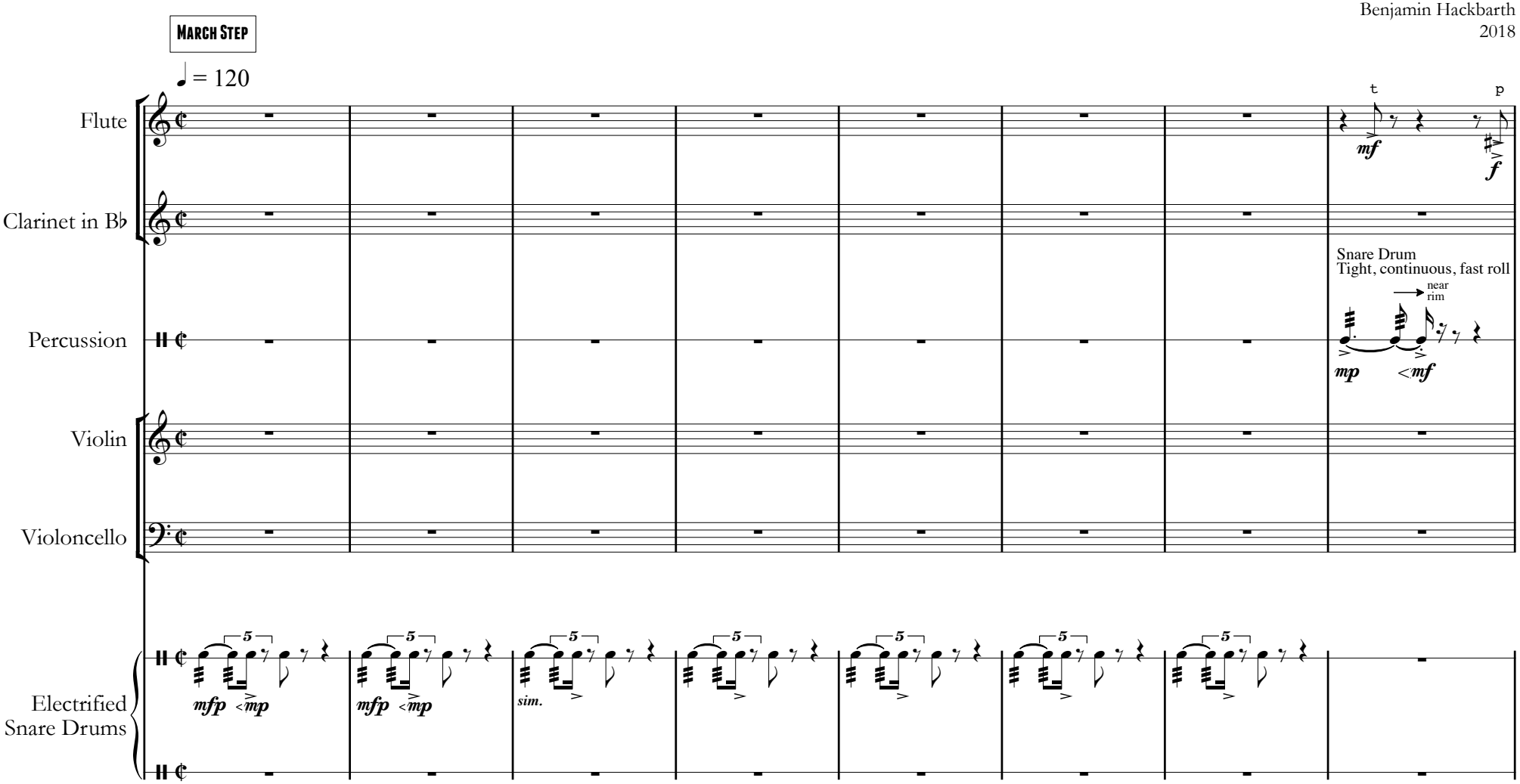
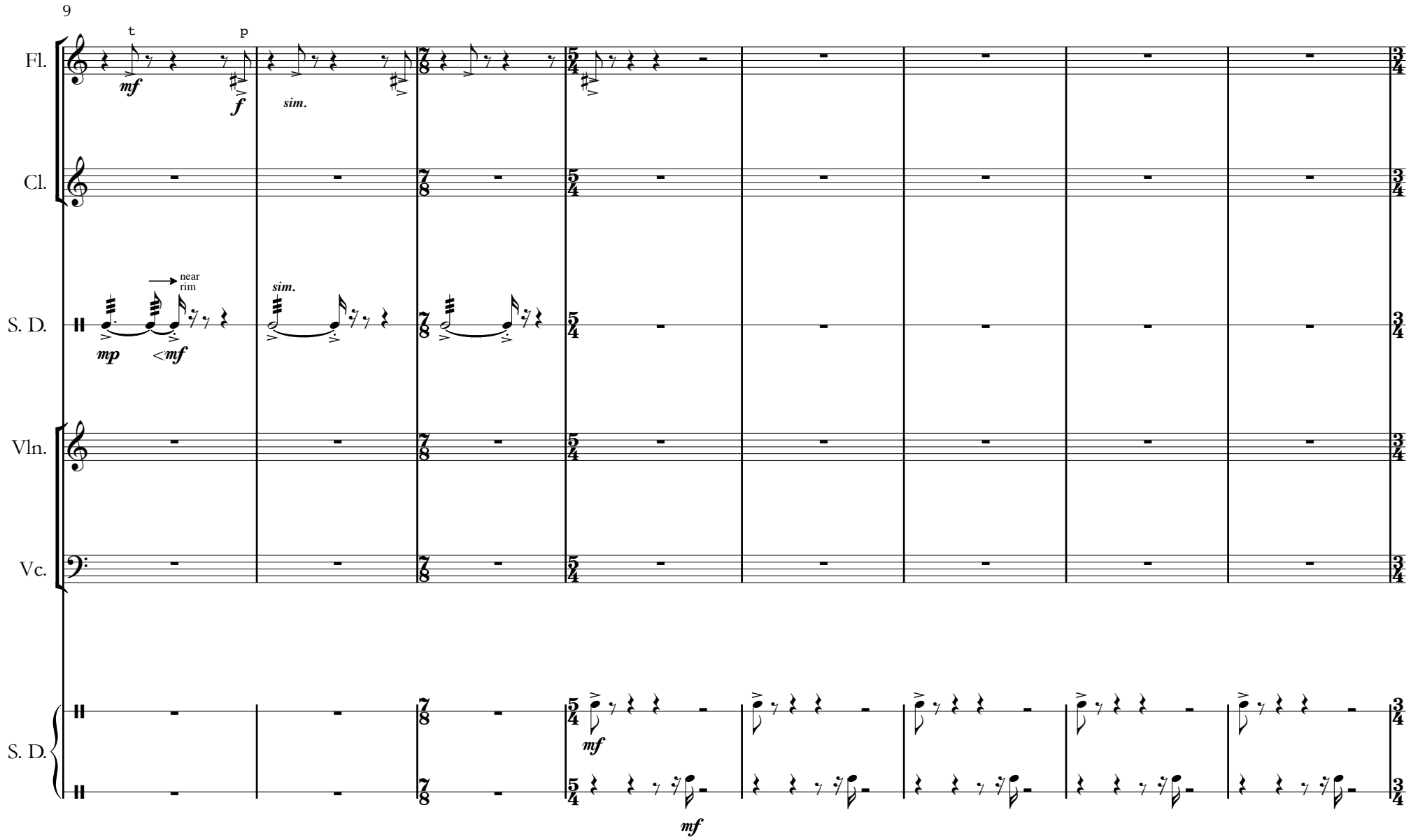
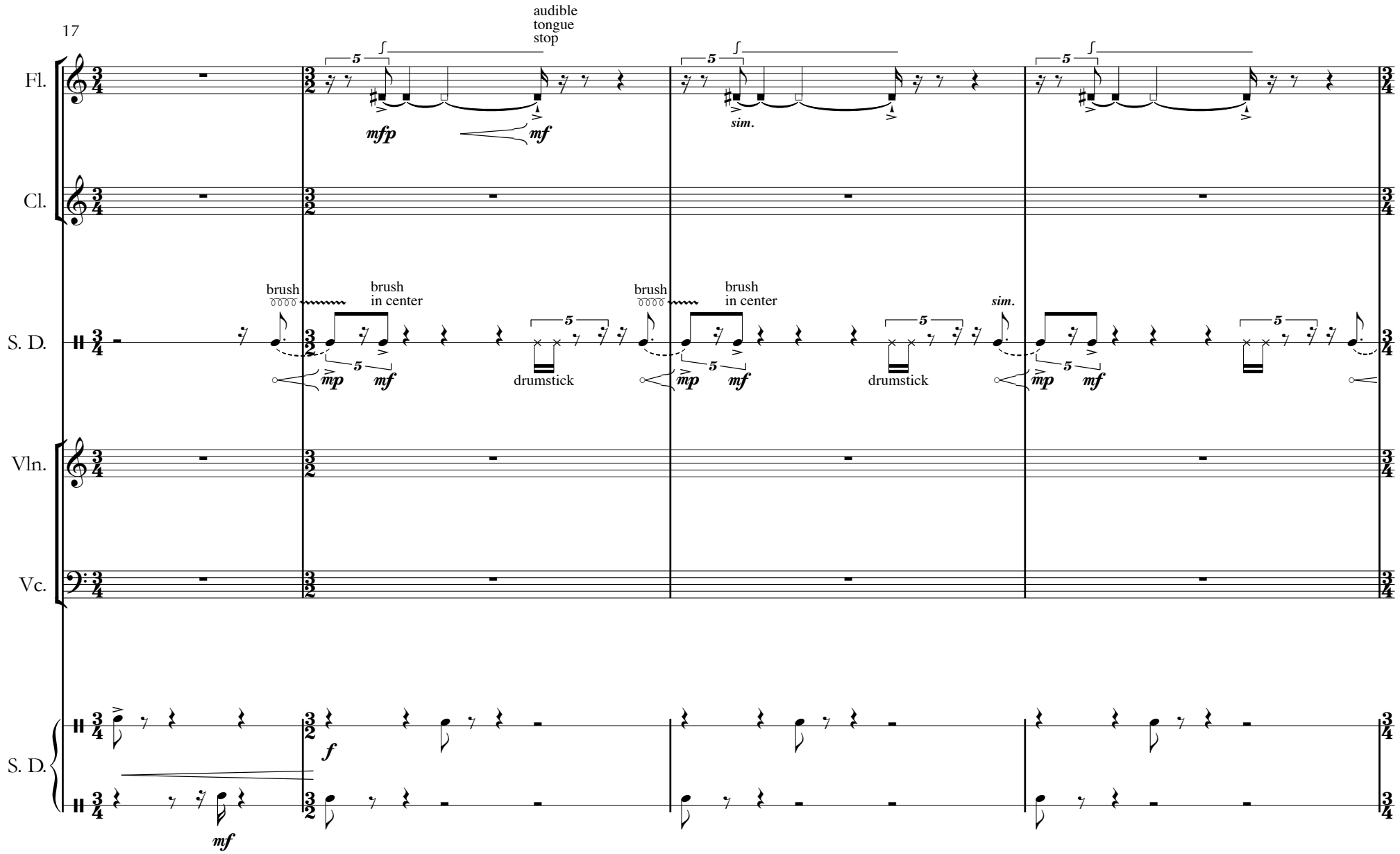
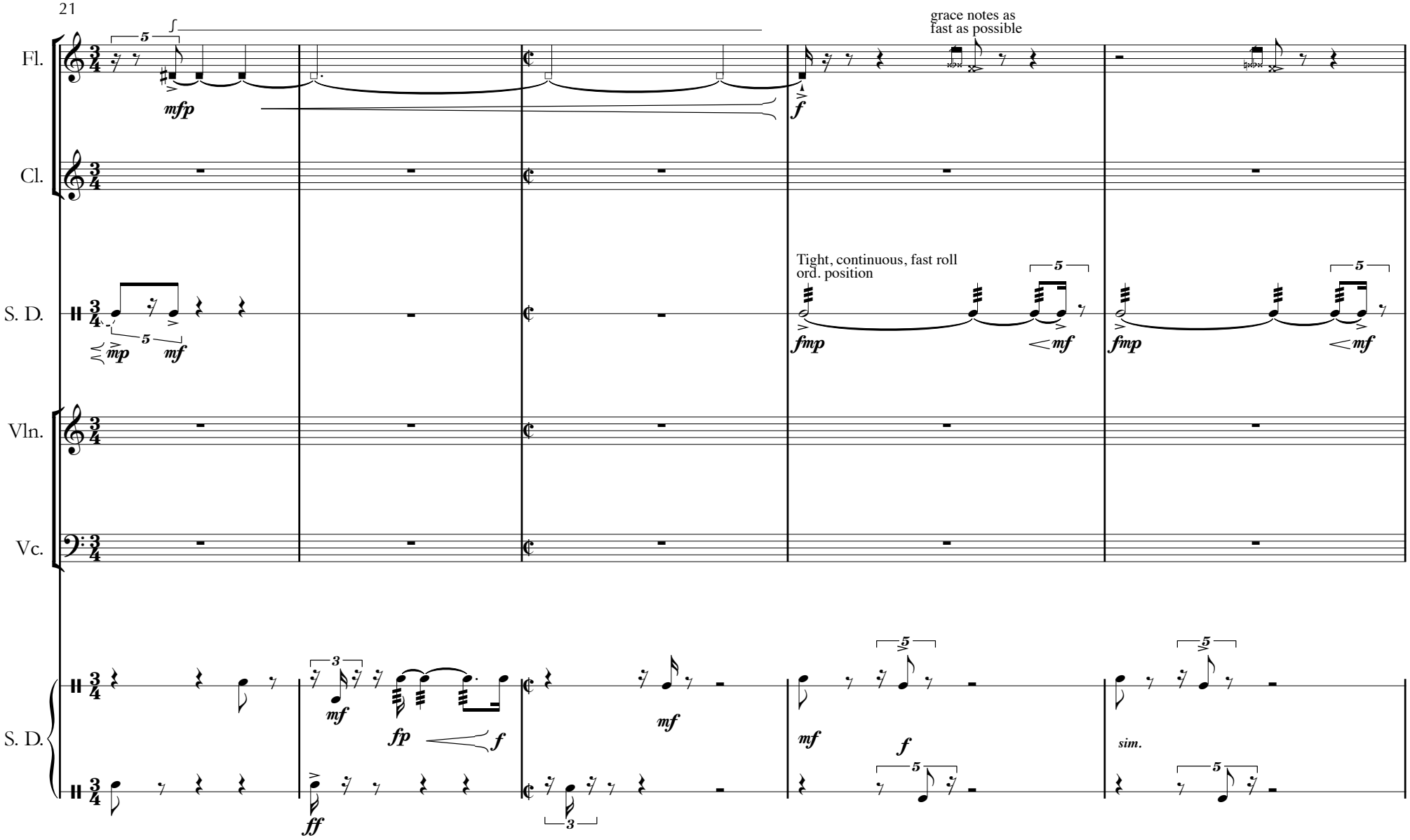
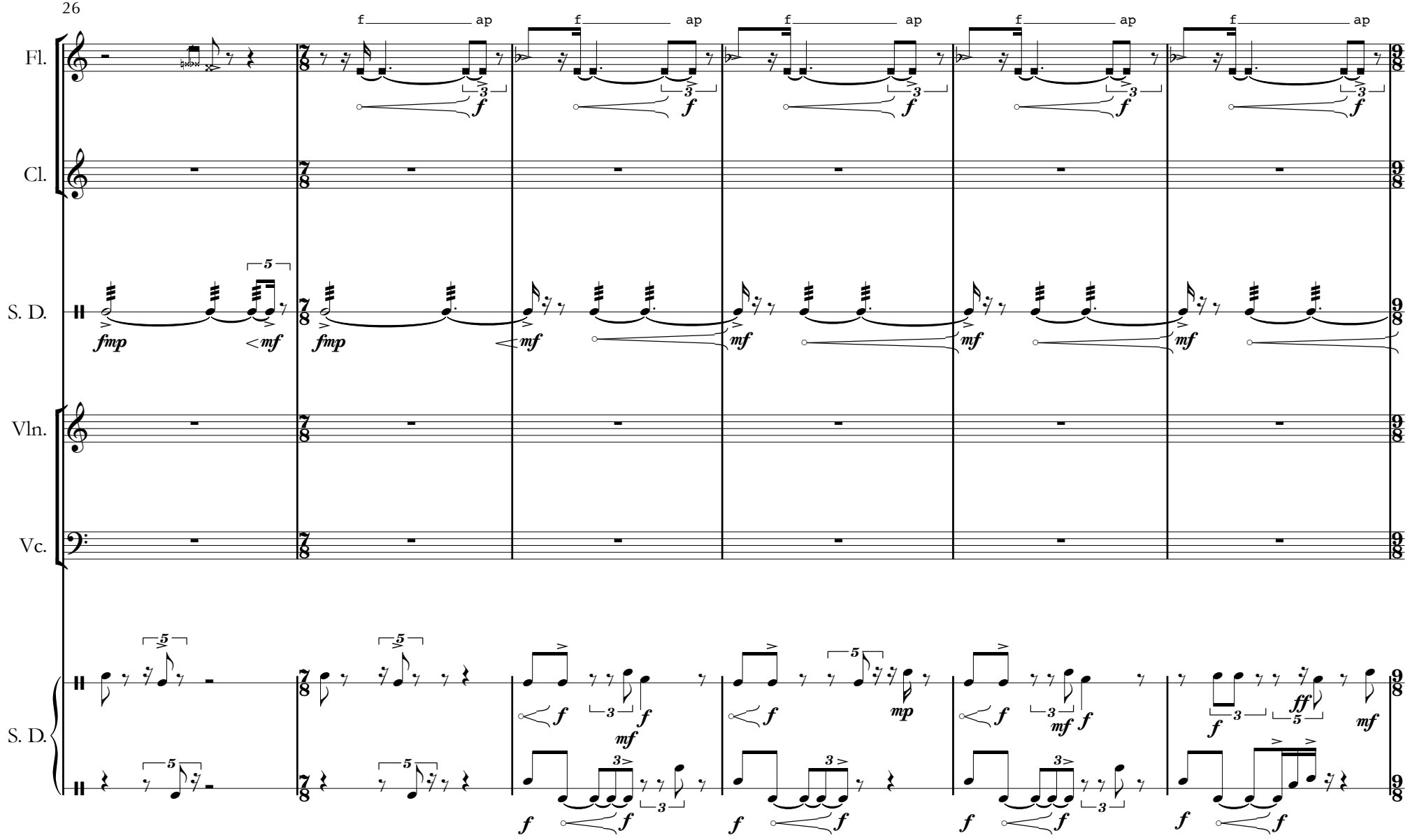
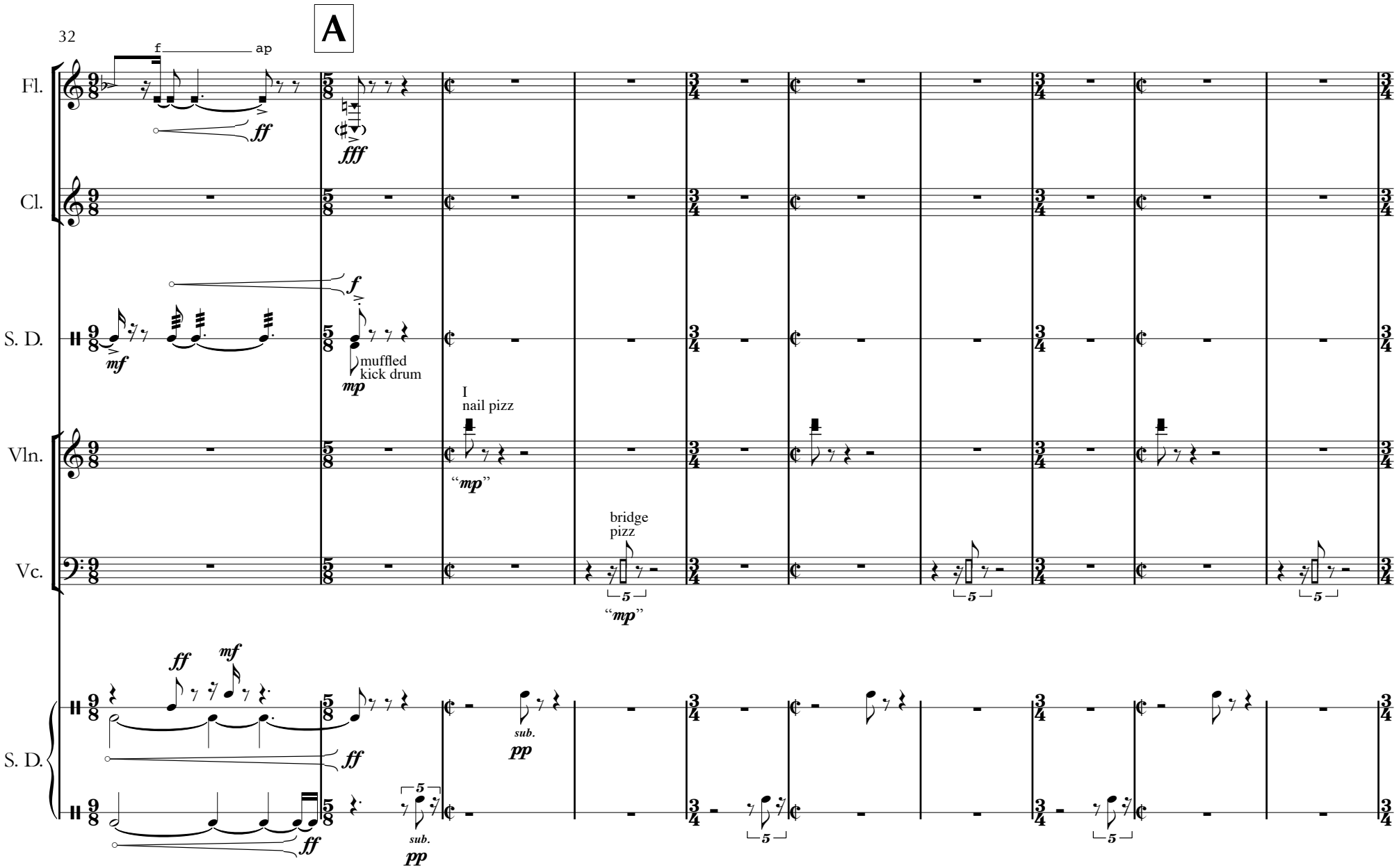


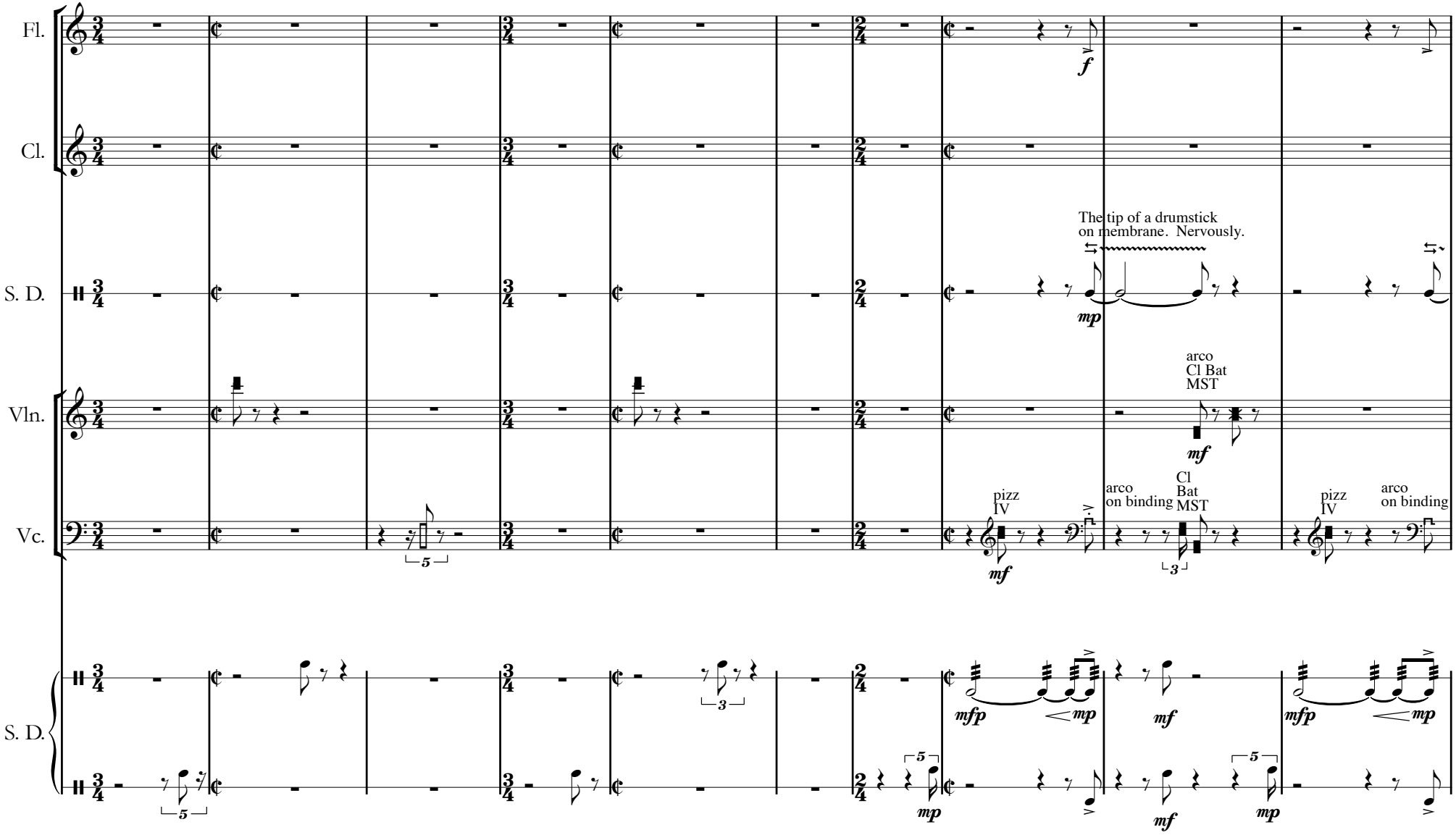

9
Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
t
p
mf
f
sim.
near rim
mp
<mf
sim.
mf
mf

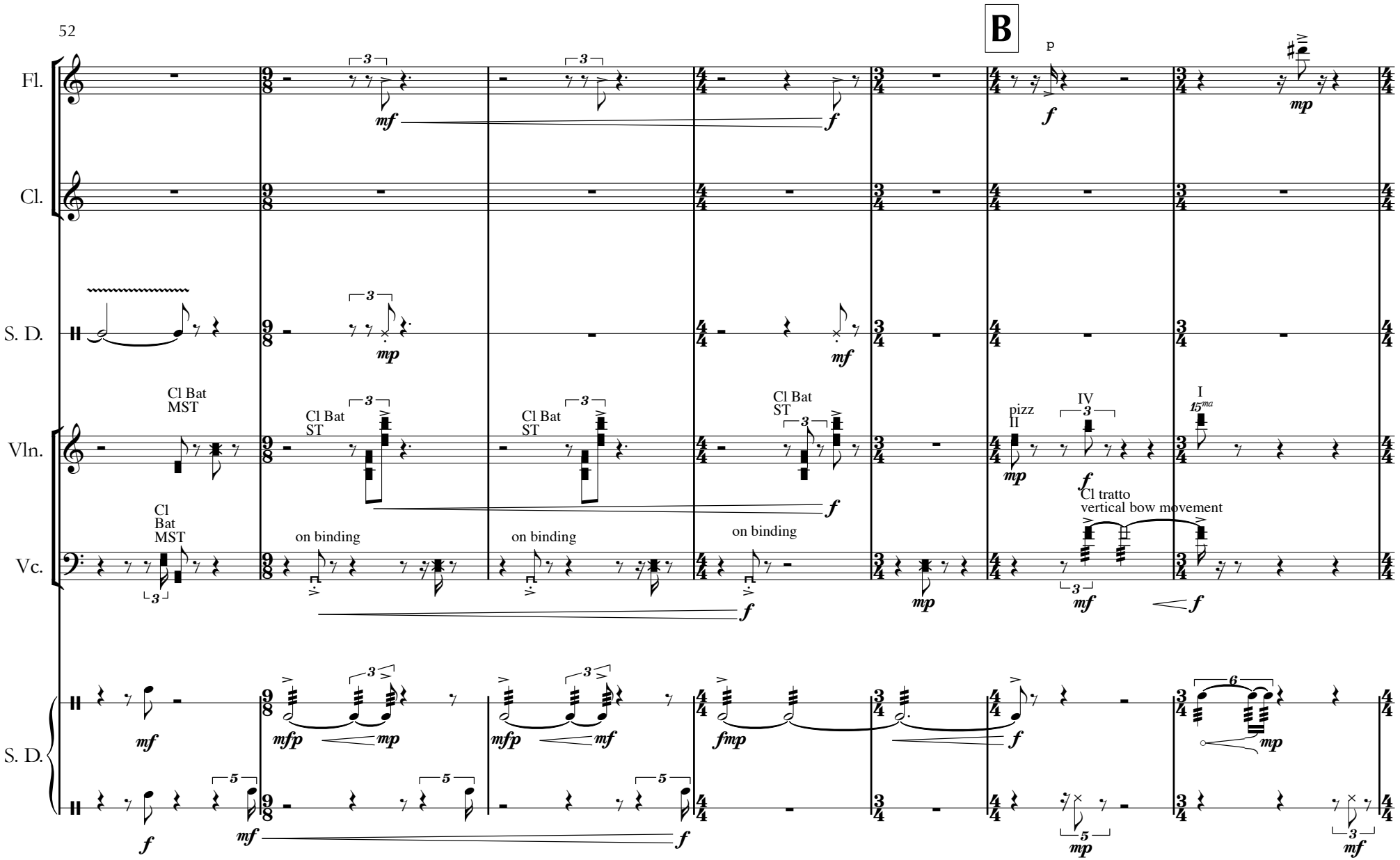

17
audible
tongue
stop
Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
mfp
mf
sim.
brush
brush
in center
mp
mf
drumstick
brush
brush
in center
mp
mf
drumstick
sim.
mp
mf
f
mf

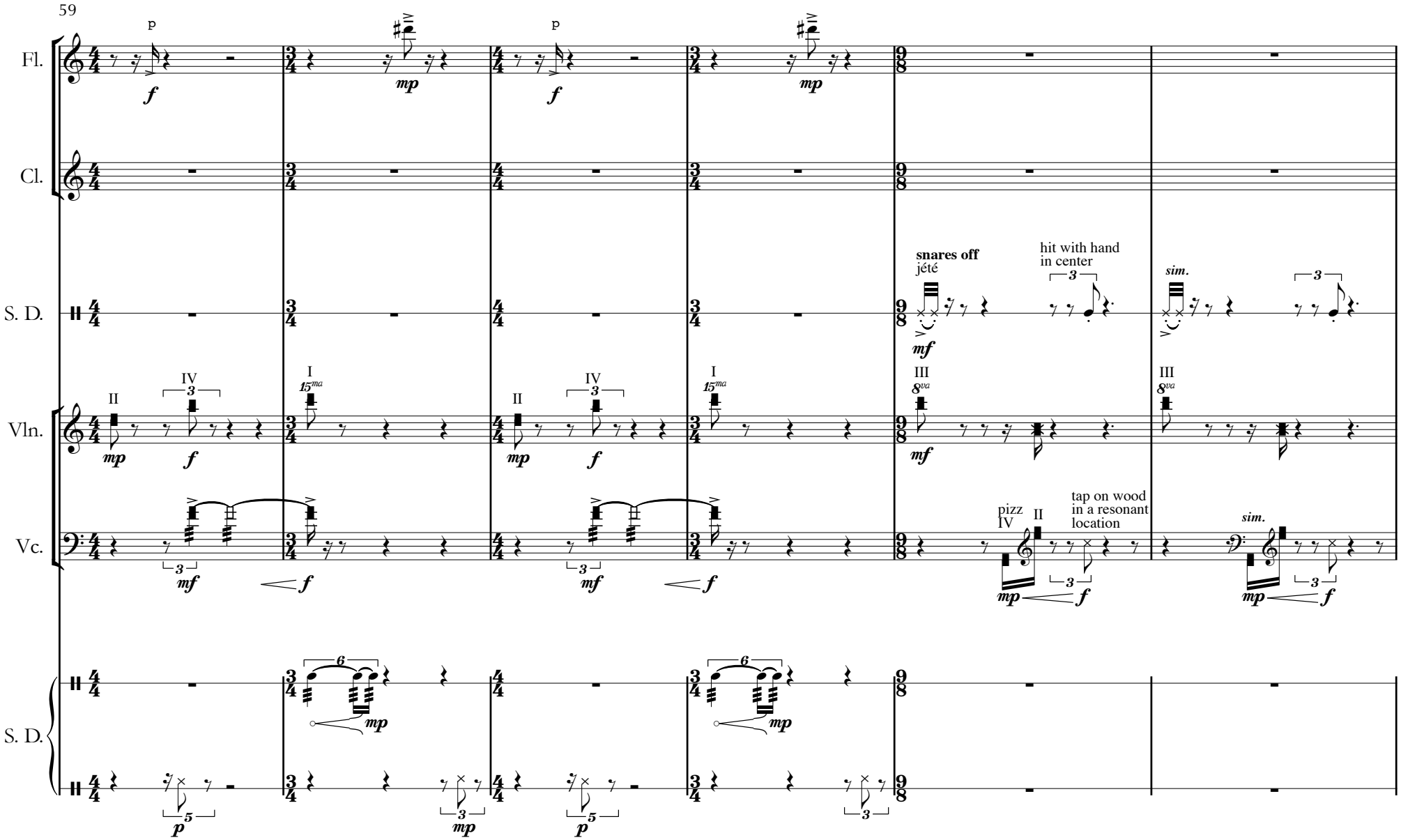

21
Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
mfp
f
grace notes as
fast as possible
Tight, continuous, fast roll
ord. position
fmp
mf
mp
fp
ff
sim.

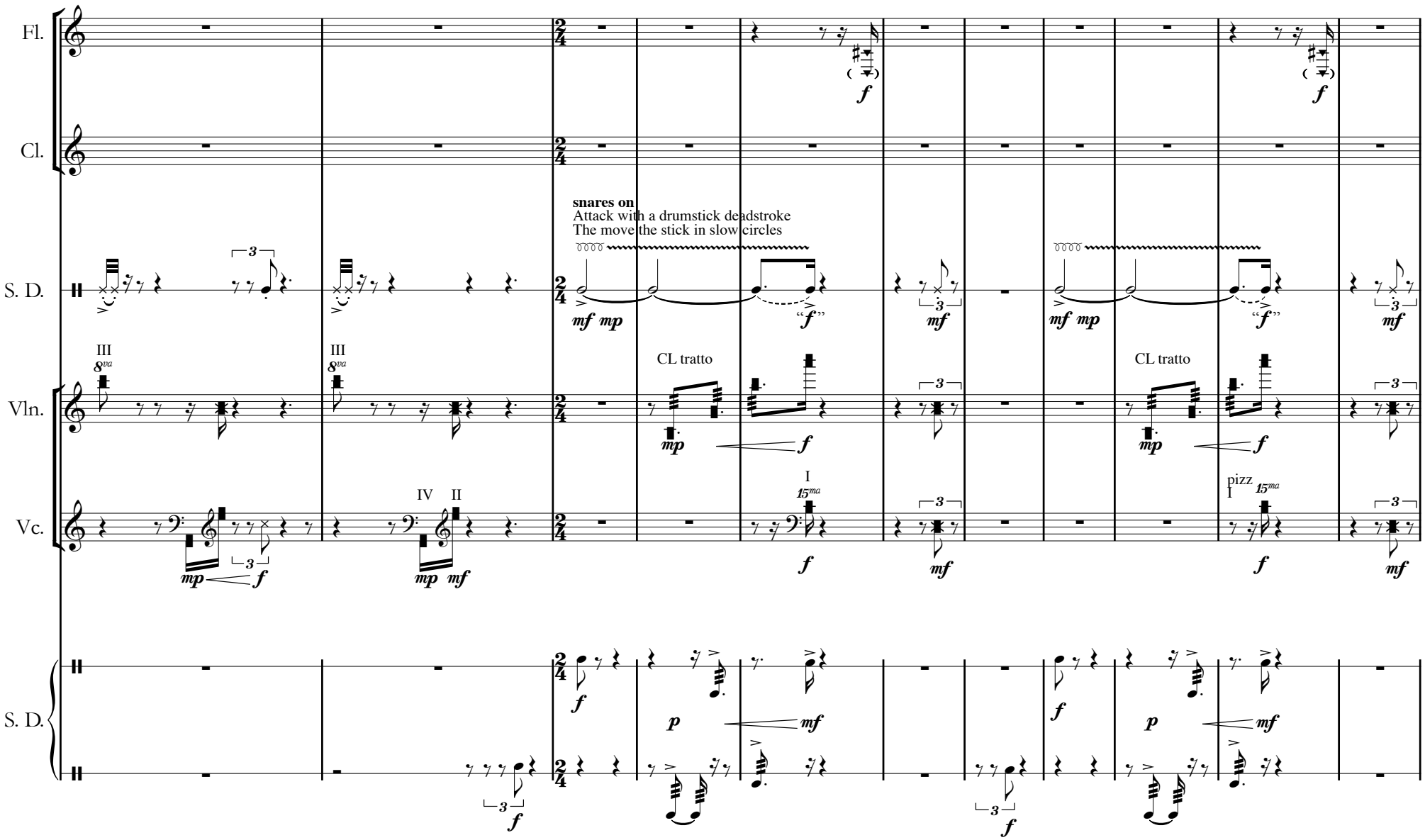

Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
f ap
fmp
mf
mp
ff

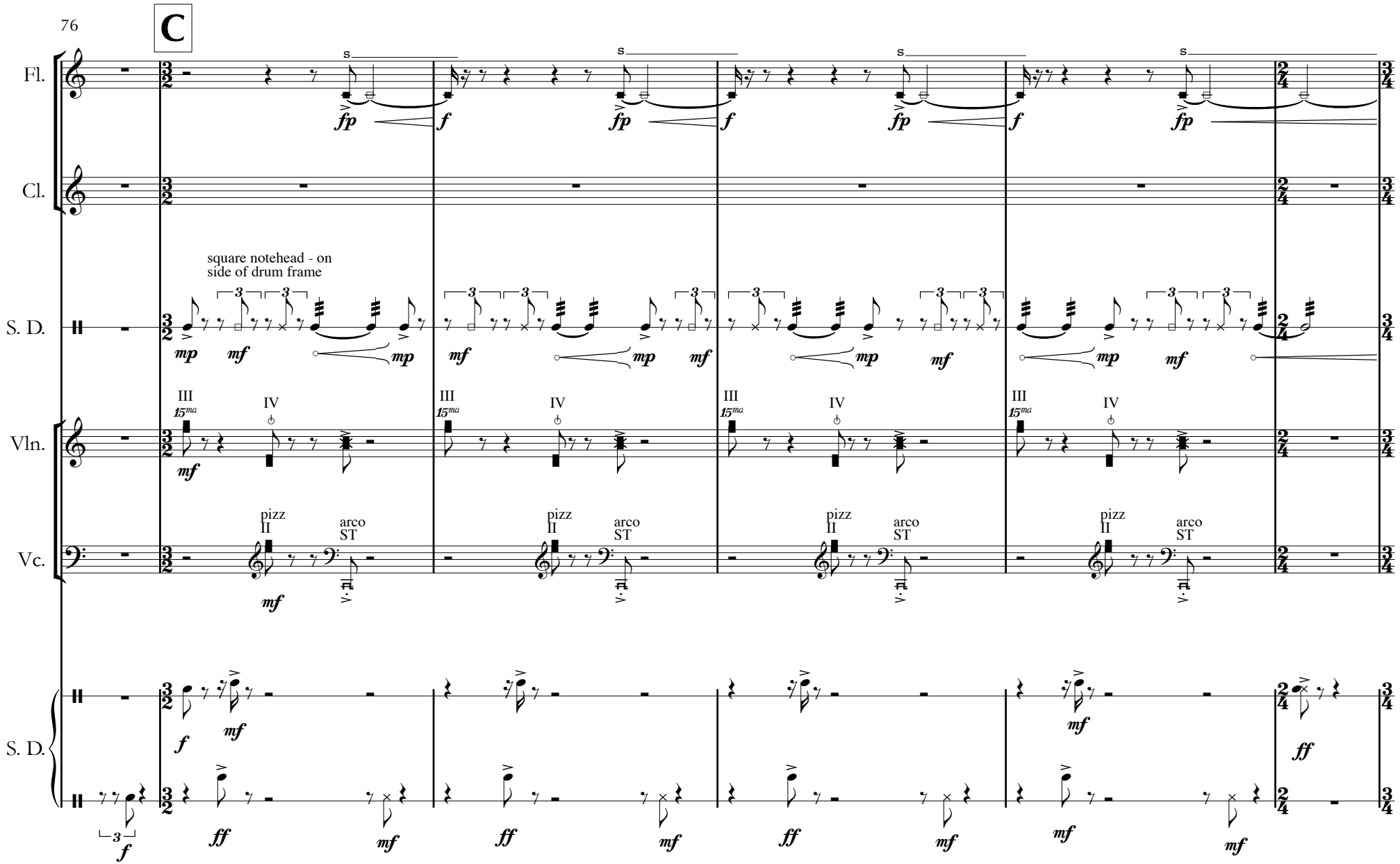

32
A
Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
muffled
kick drum
I
nail pizz
bridge
pizz
sub.
sub.

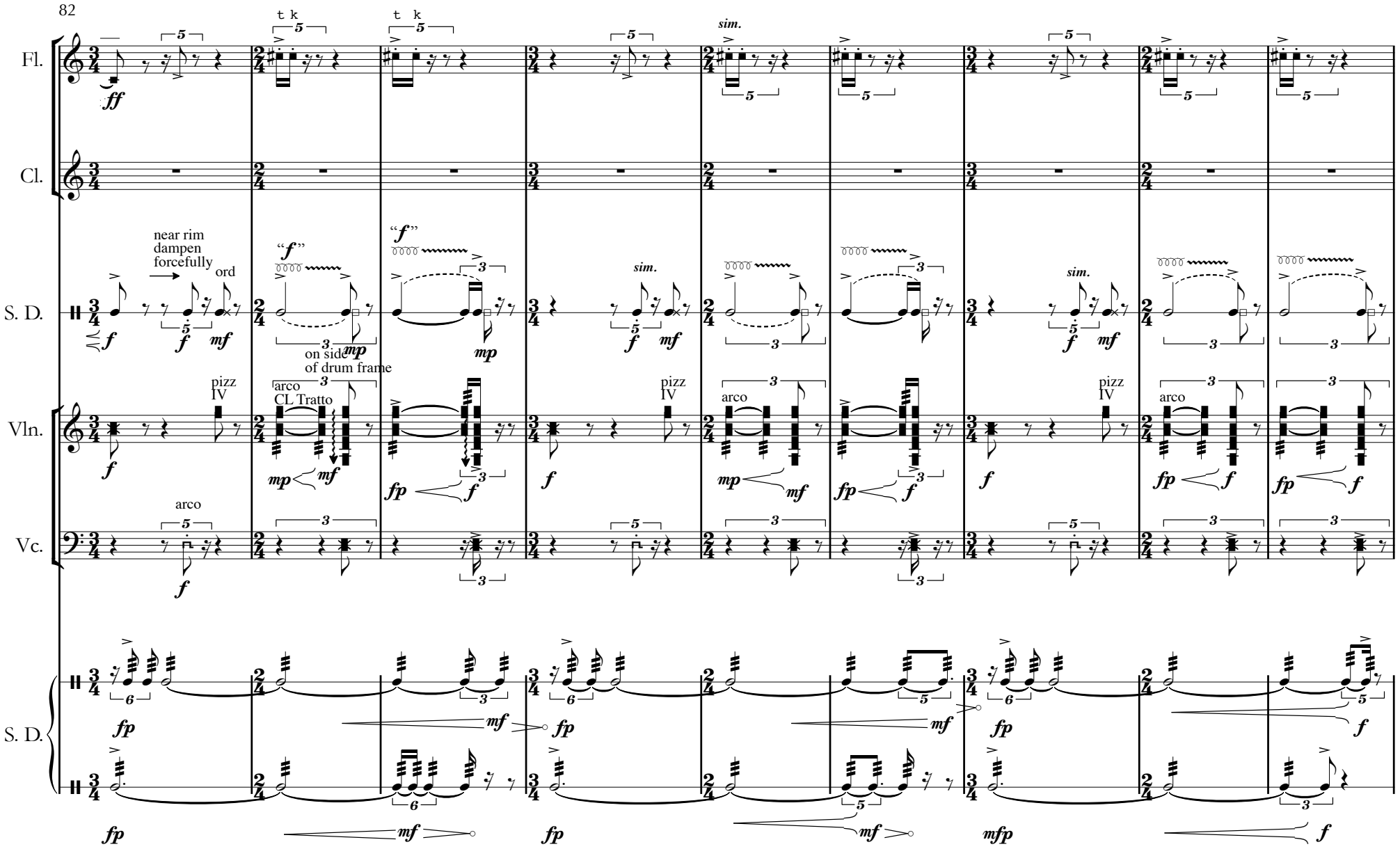

Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
The tip of a drumstick
on membrane. Nervously.
arco
Cl Bat
MST
pizz
IV
arco
on binding
Cl
Bat
MST
pizz
IV
arco
on binding

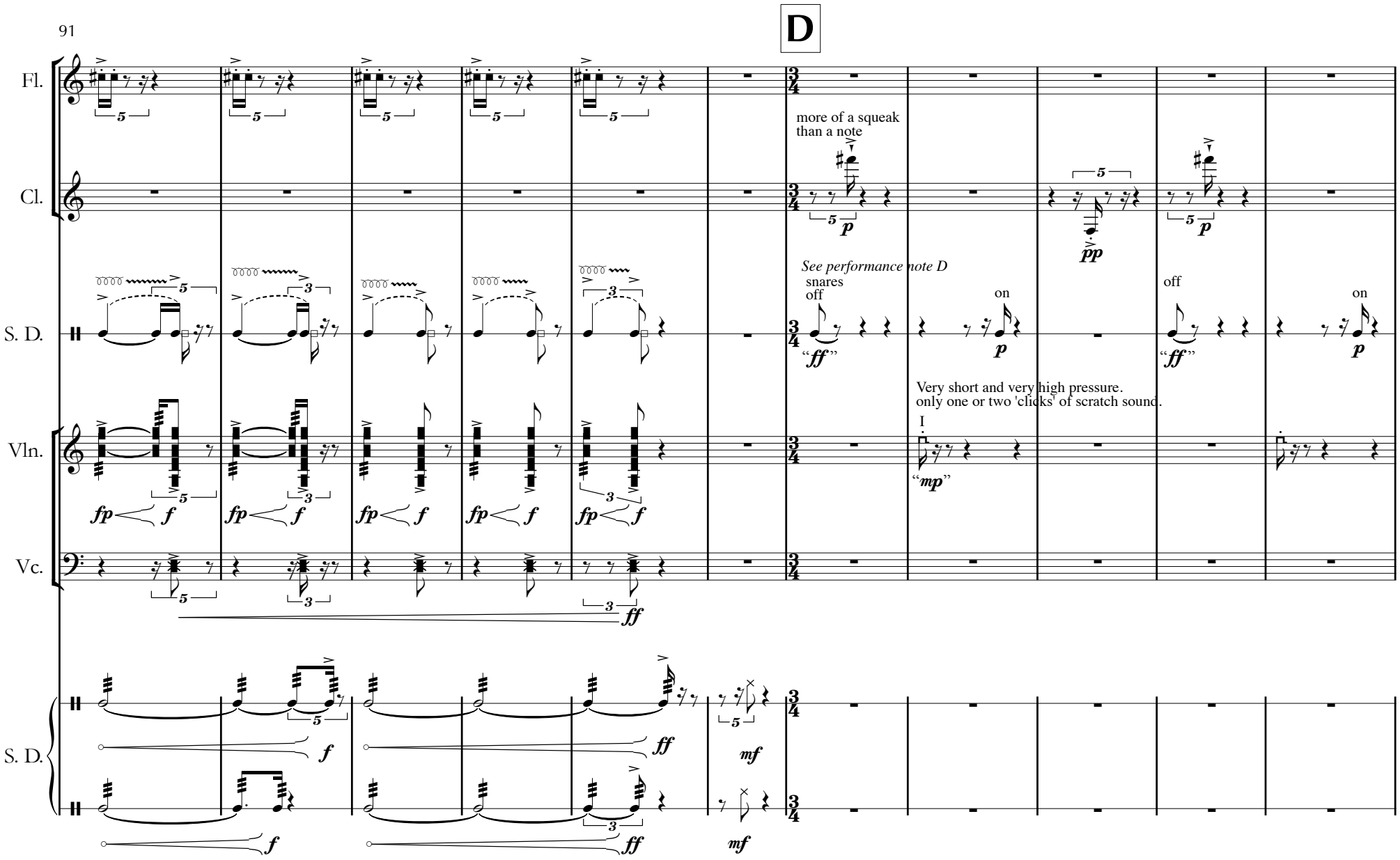

B
Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
Cl Bat MST
Cl Bat ST
Cl Bat ST
Cl Bat ST
pizz II
IV
I
15ma
Cl Bat MST
on binding
on binding
on binding
Cl tratto
vertical bow movement

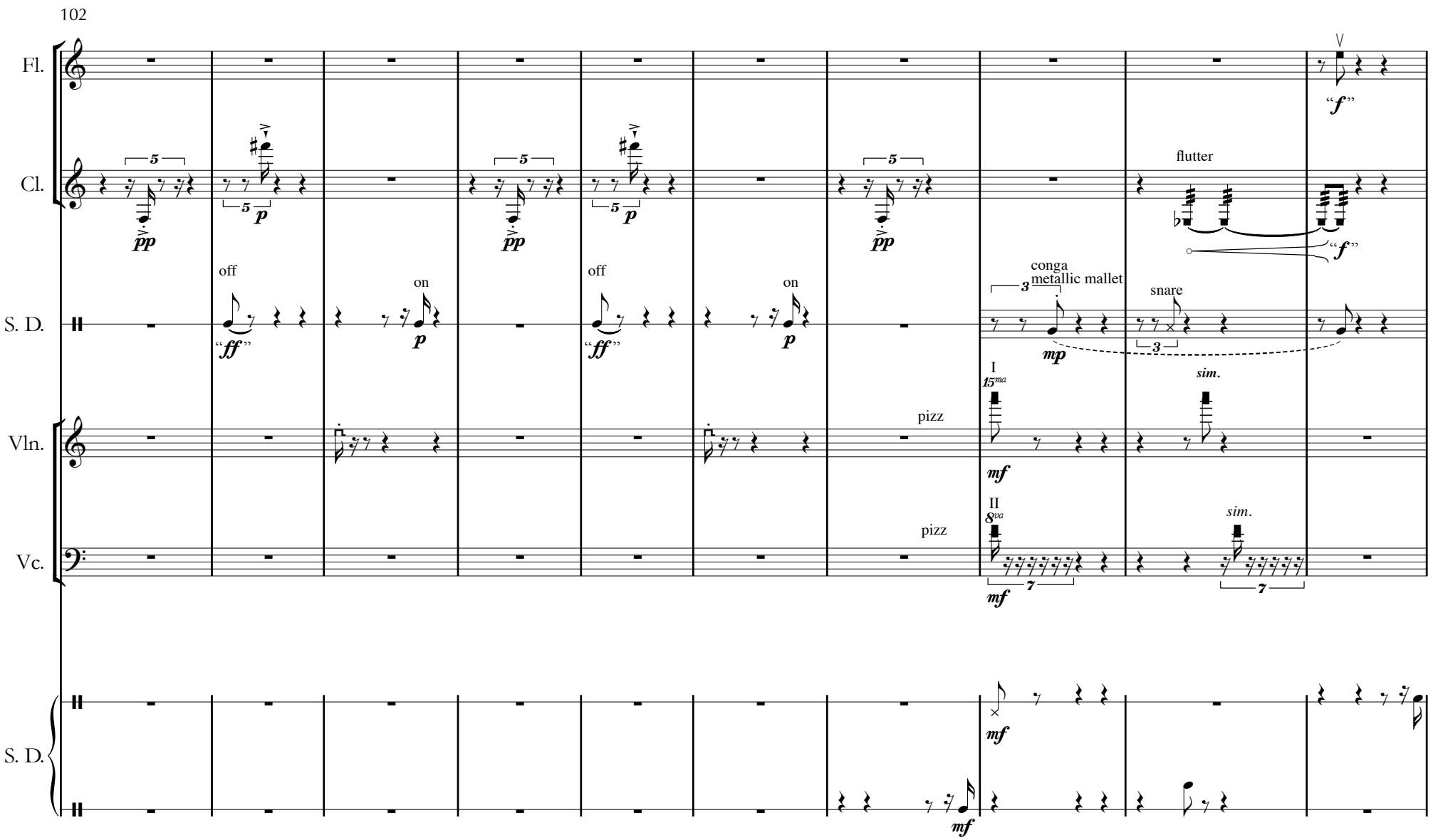

59
Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
snares off
jété
hit with hand
in center
sim.
pizz
tap on wood
in a resonant
location
sim.

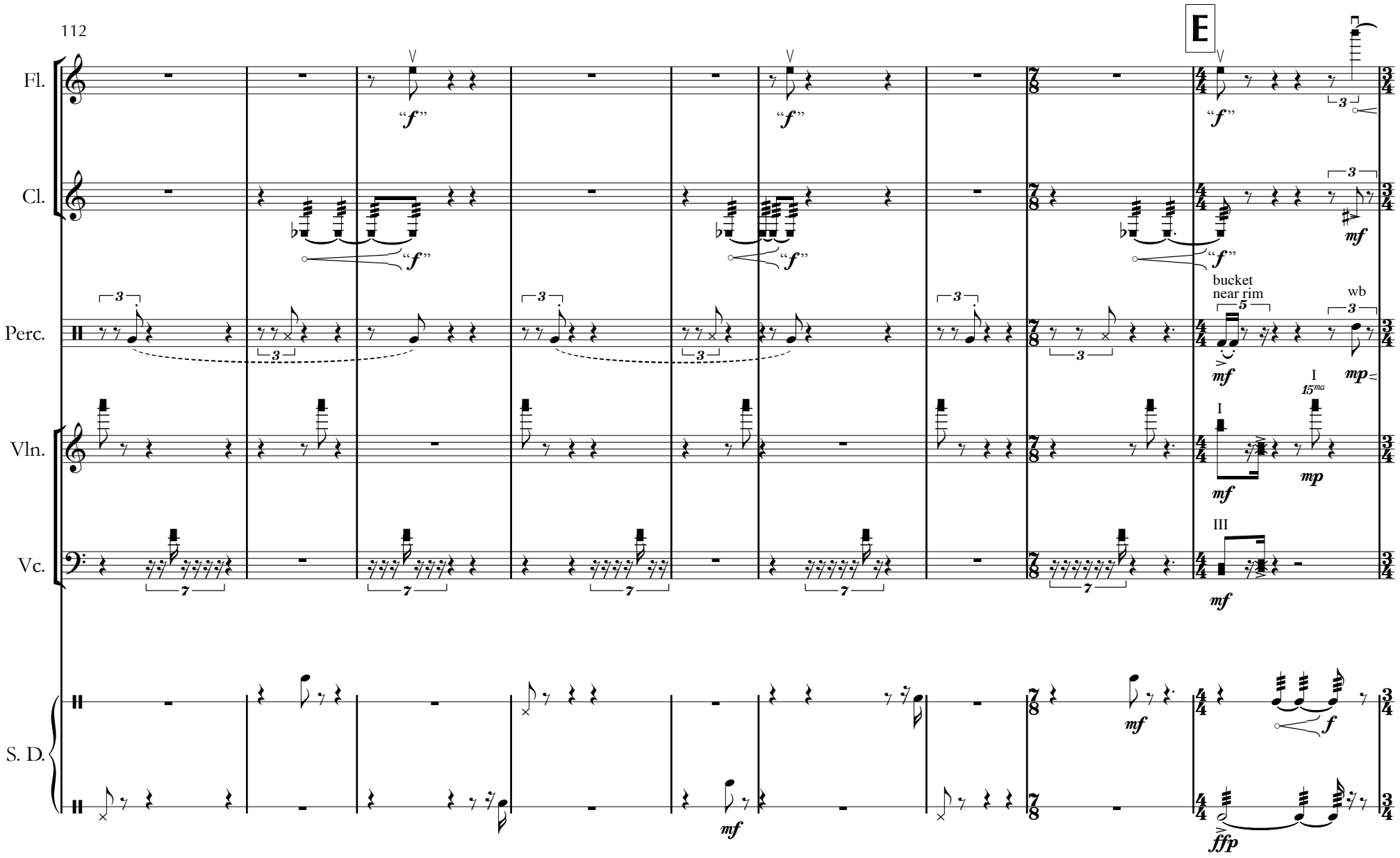

Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
snares on
Attack with a drumstick deadstroke
The move the stick in slow circles
CL tratto
CL tratto
pizz

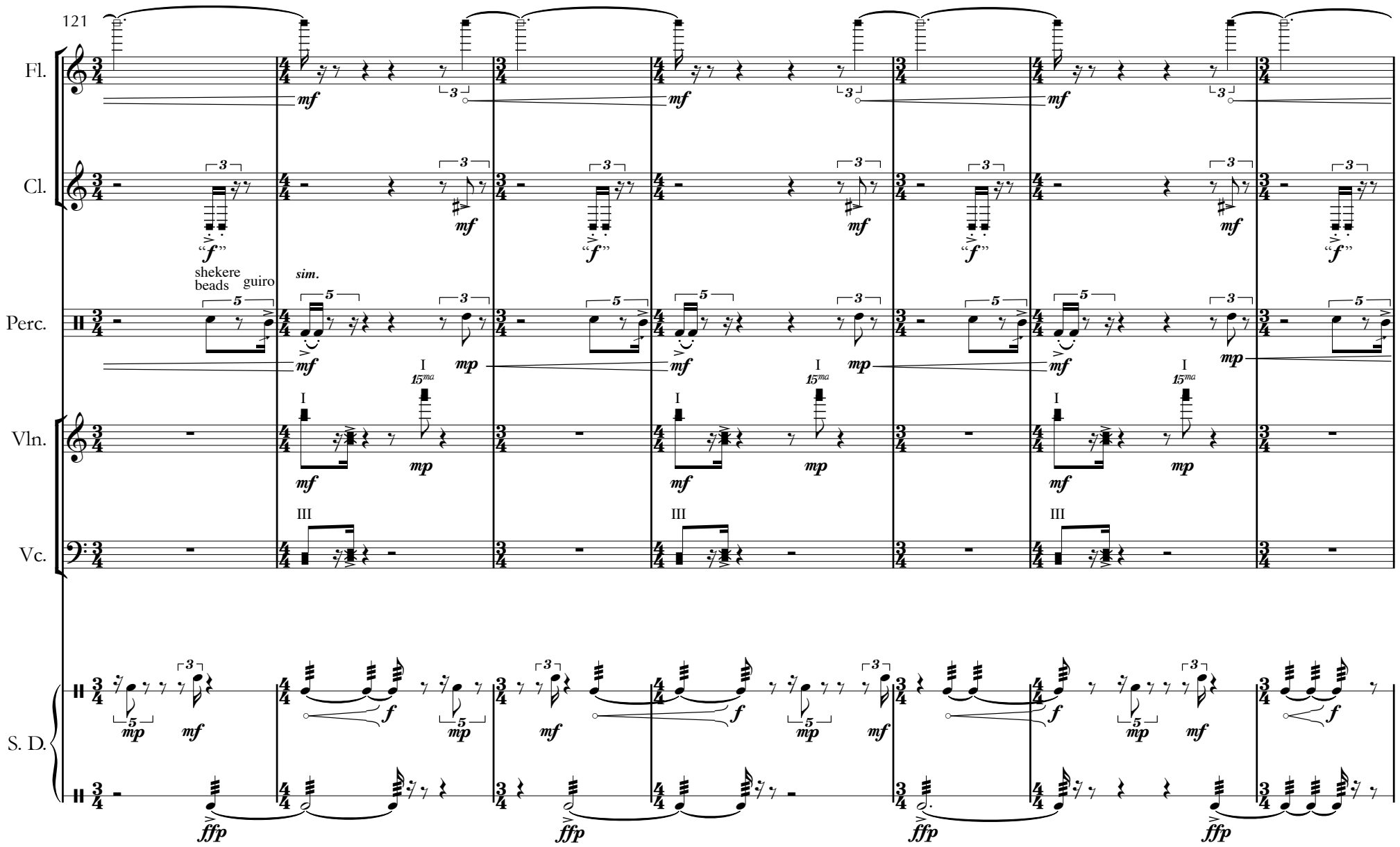

C
Fl.
Cl.
S. D.
square notehead - on
side of drum frame
Vln.
III
15ma
IV
Vc.
pizz
II
arco
ST
S. D.

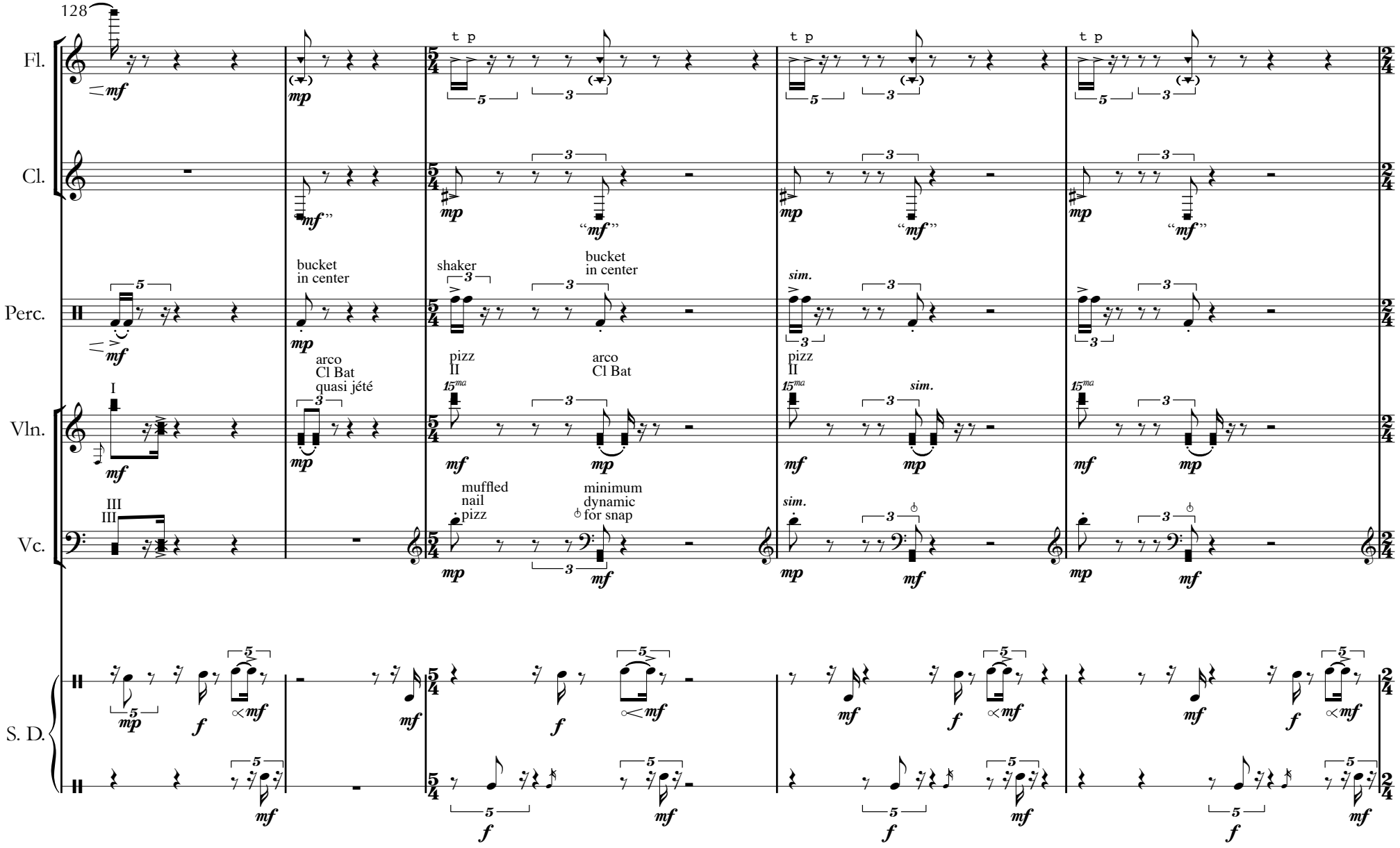

Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
t k
sim.
near rim
dampen
forcefully
ord
"f"
mp
on side
of drum frame
pizz
IV
arco
CL Tratto
mf
fp
mfp

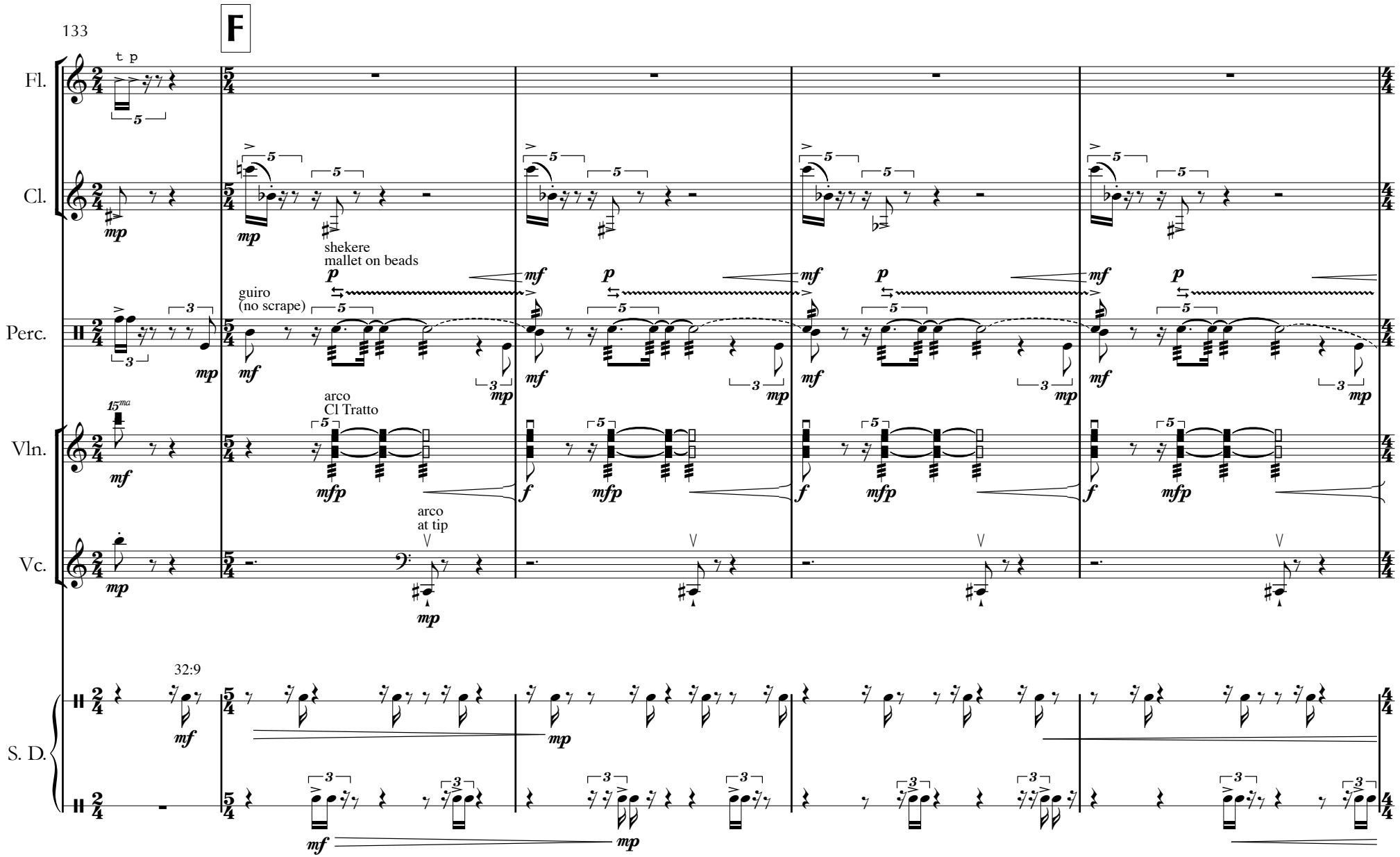

D
Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
more of a squeak
than a note
See performance note D
snares
off
on
off
on
Very short and very high pressure.
only one or two 'clicks' of scratch sound.
I

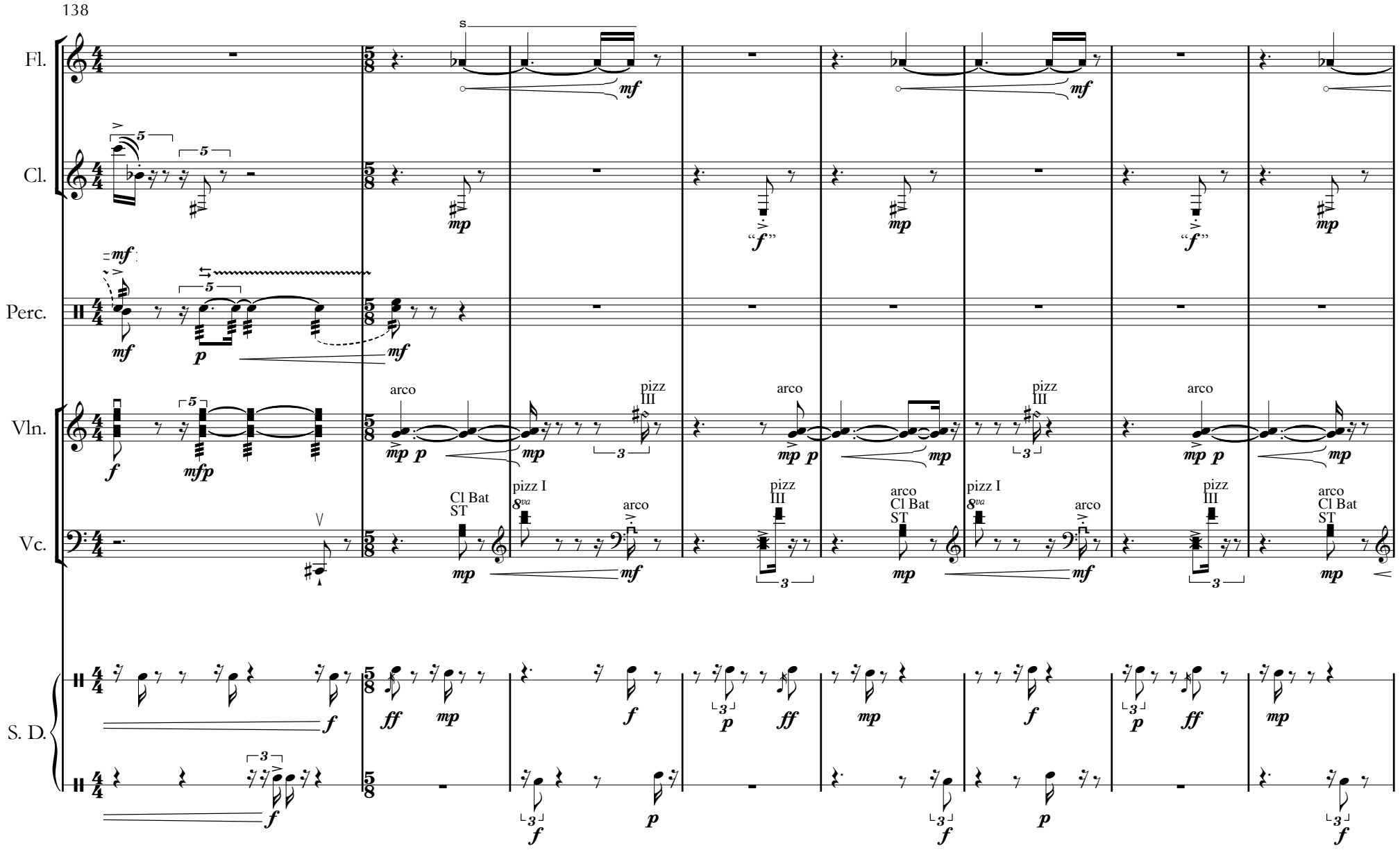

102
Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
"f"
flutter
"f"
off
on
off
on
"ff"
p
"ff"
p
conga
metallic mallet
snare
mp
I
15ma
sim.
pizz
mf
II
8va
sim.
pizz
mf
mf
mf

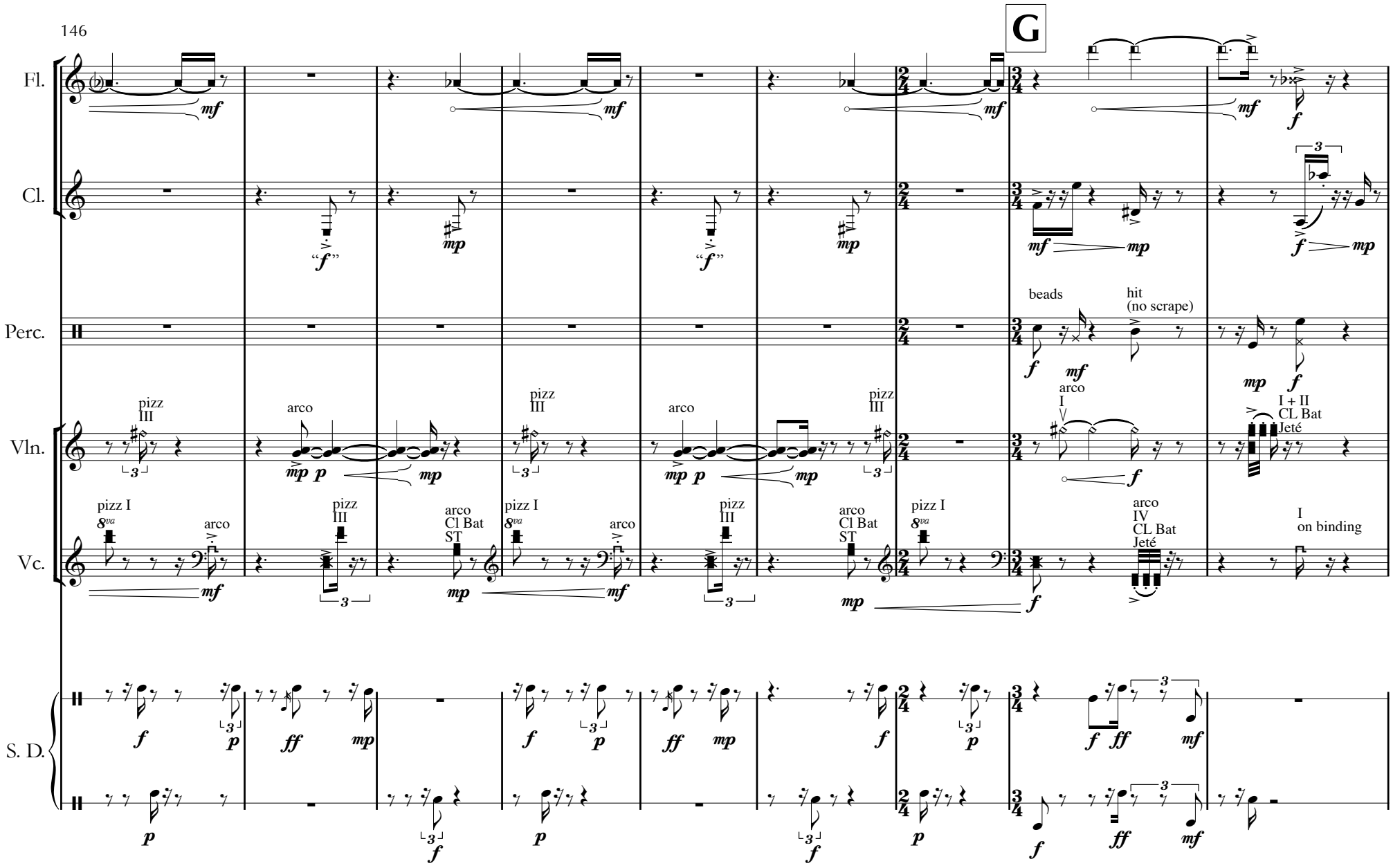

E
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
"f"
mf
mp
ffp
bucket
near rim
wb
I
III
15ma

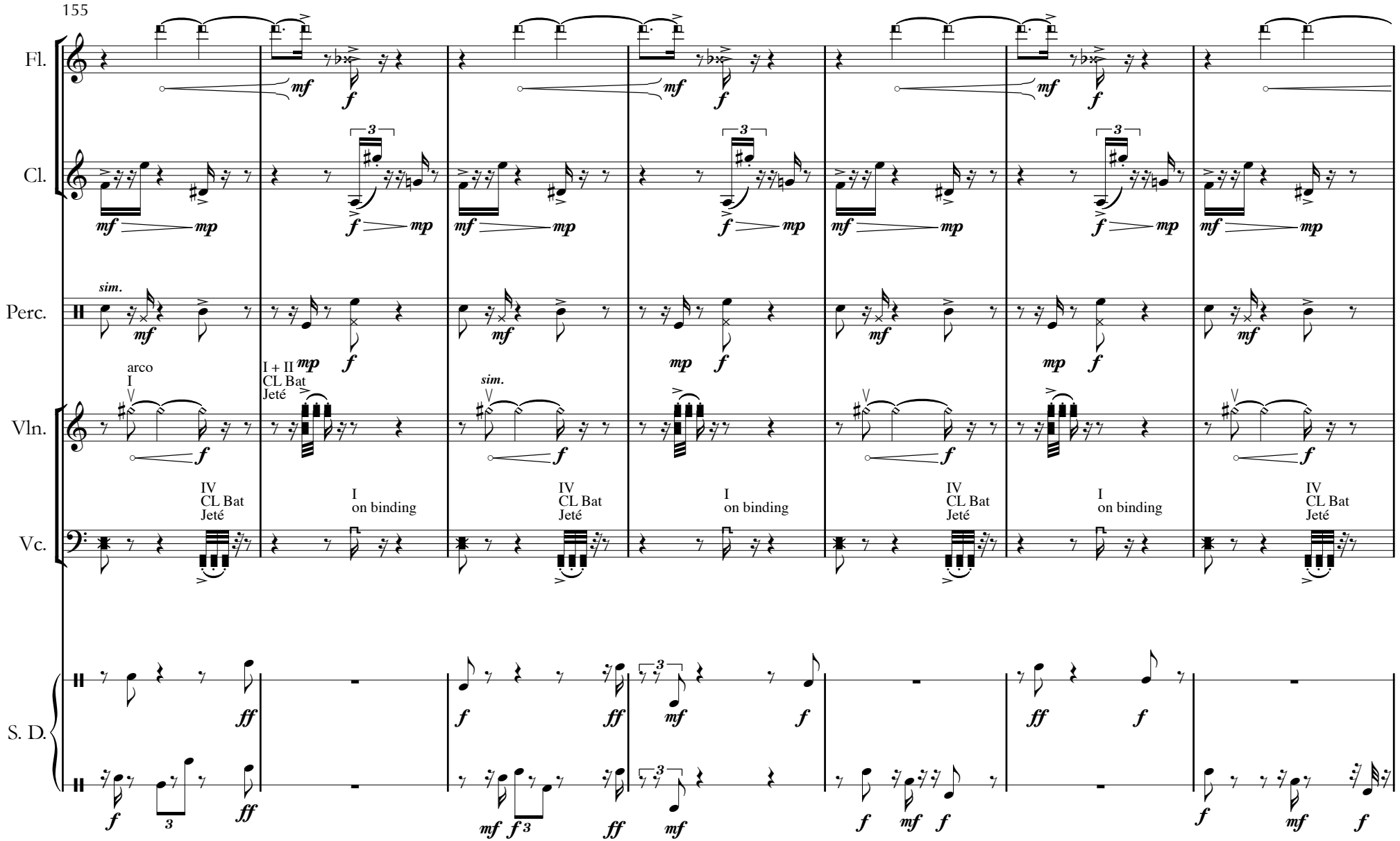

121
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
shekere
beads
guiro
sim.
mf
mp
f
ffp
I
III
15ma

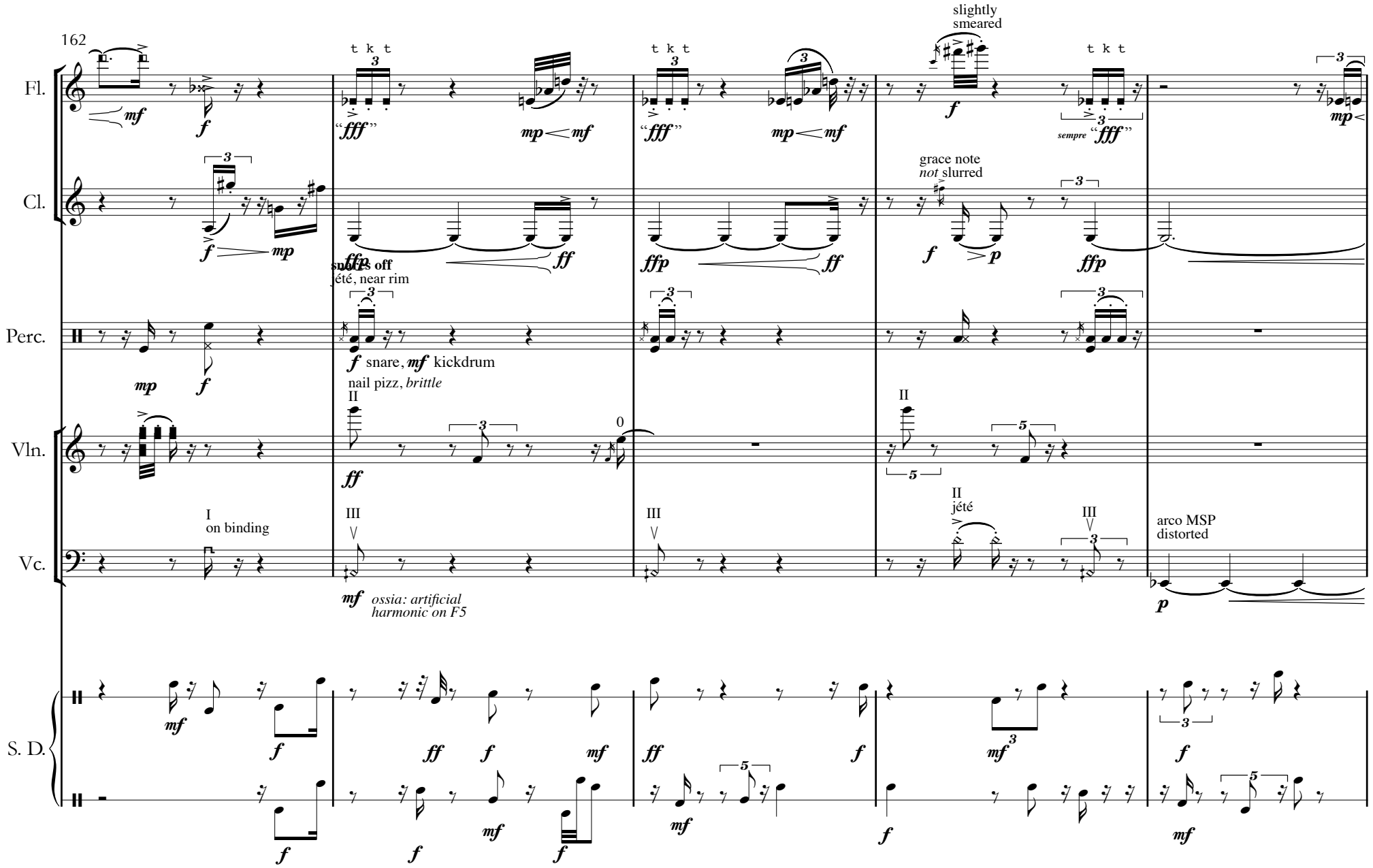

128
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
t p
bucket
in center
shaker
bucket
in center
sim.
arco
Cl Bat
quasi jété
pizz
II
arco
Cl Bat
15ma
sim.
I
III
muffled
nail
pizz
minimum
dynamic
for snap

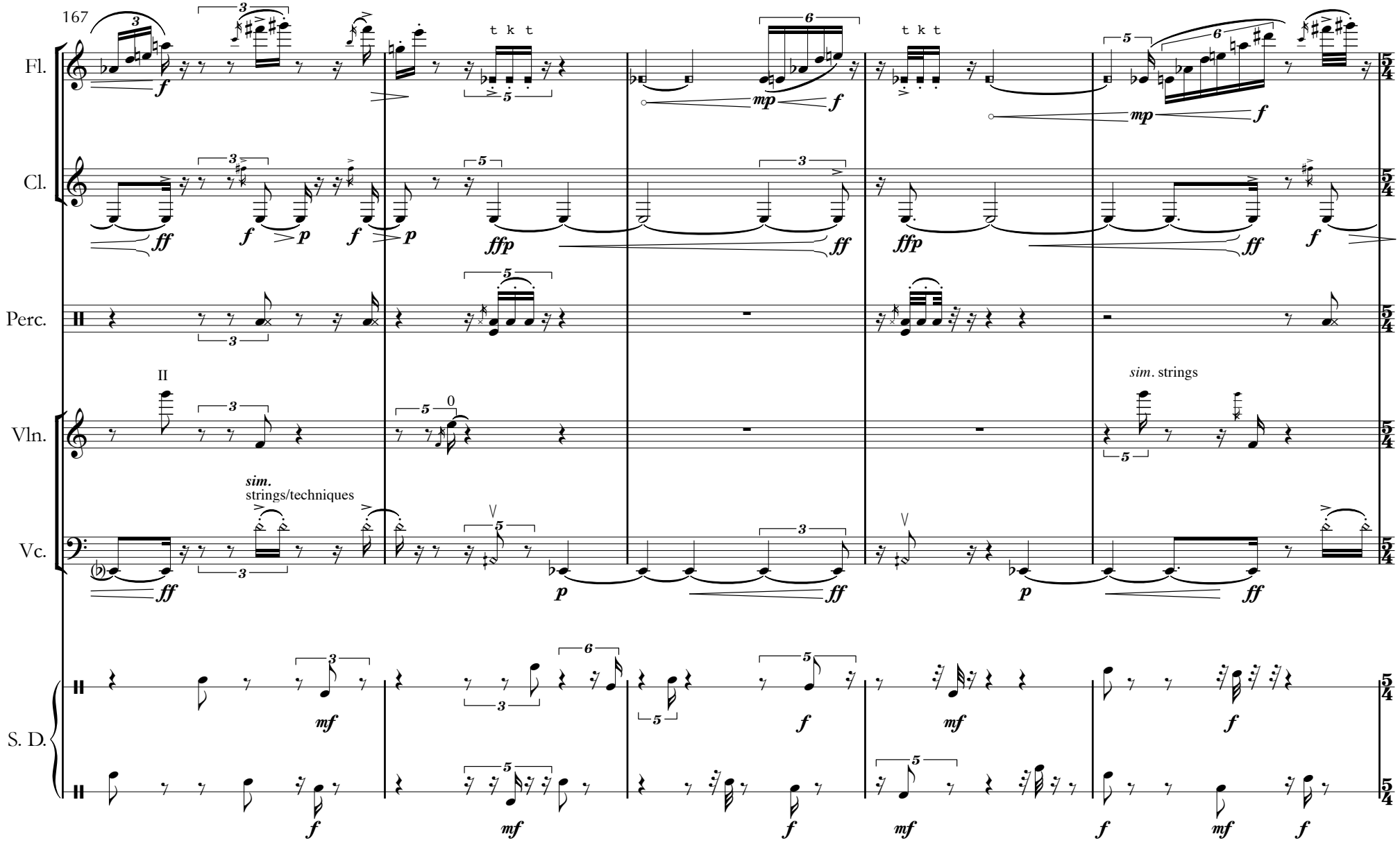

133
F
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
t p
shekere
mallet on beads
guiro
(no scrape)
arco
Cl Tratto
arco
at tip
15ma
32:9

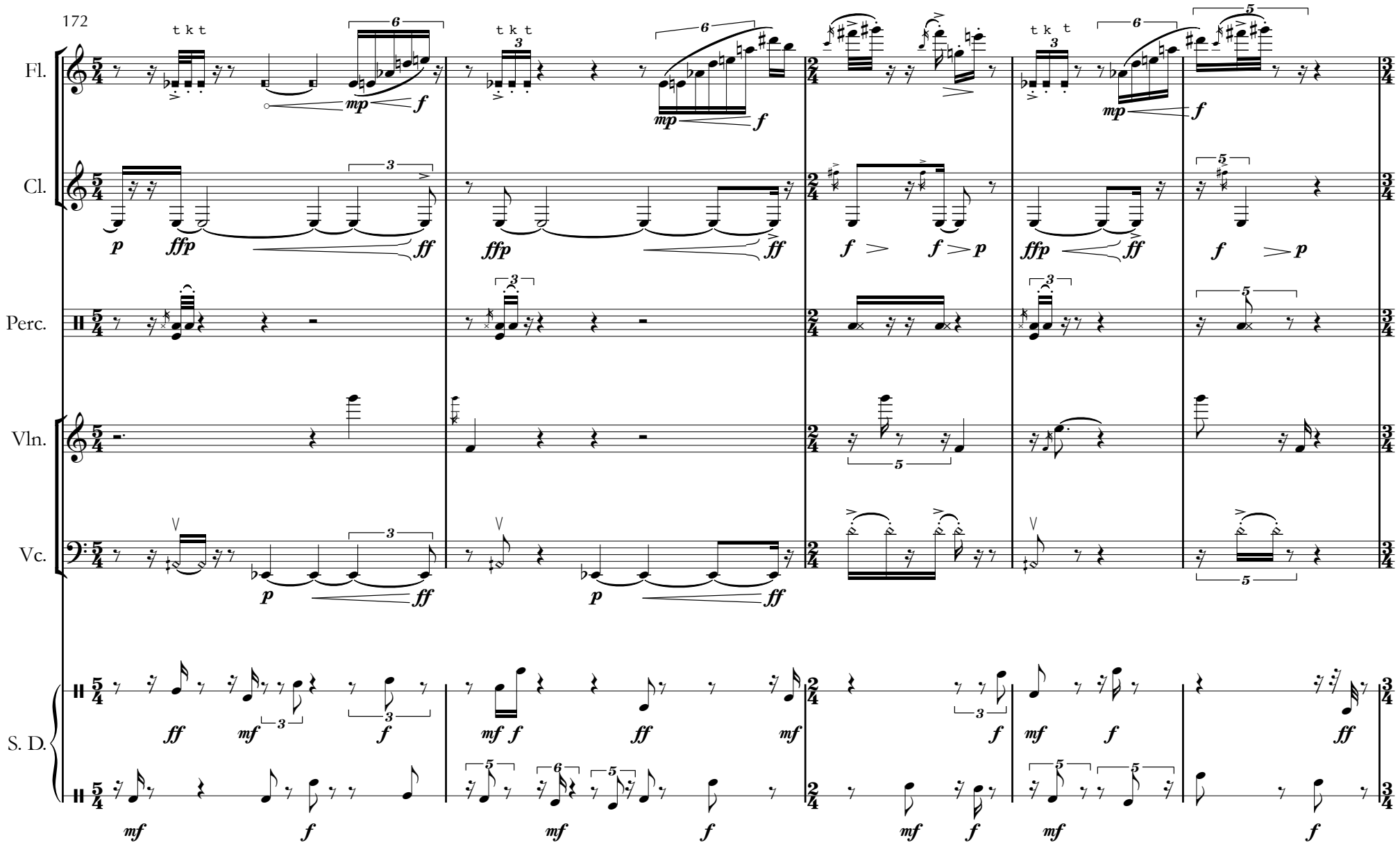

138
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
arco
pizz
III
Cl Bat
ST
pizz I
8va
arco

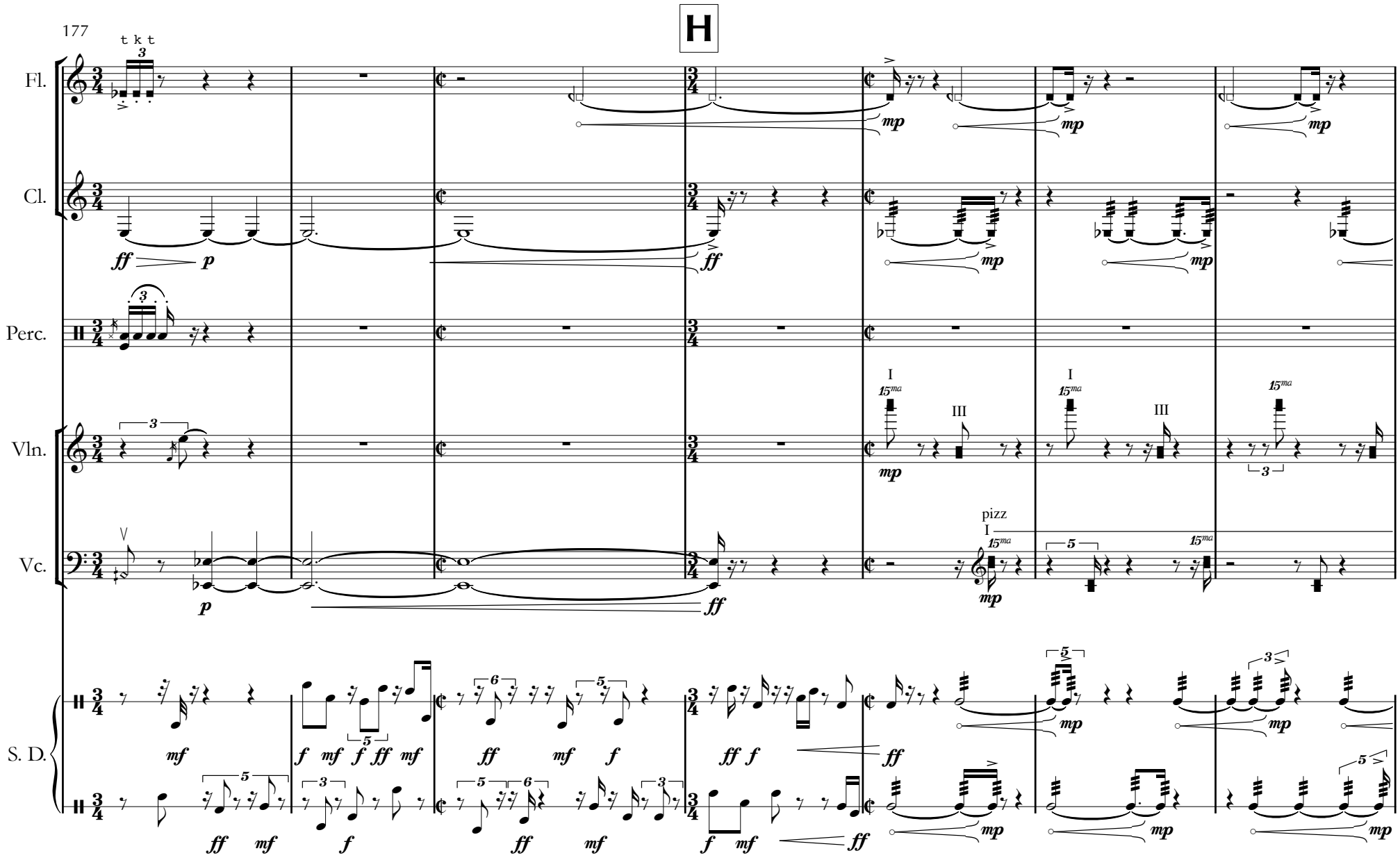

G
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
beads
hit
(no scrape)
pizz
III
arco
pizz I
8va
I + II
CL Bat
Jeté
arco
IV
CL Bat
Jeté
I
on binding
arco
Cl Bat
ST

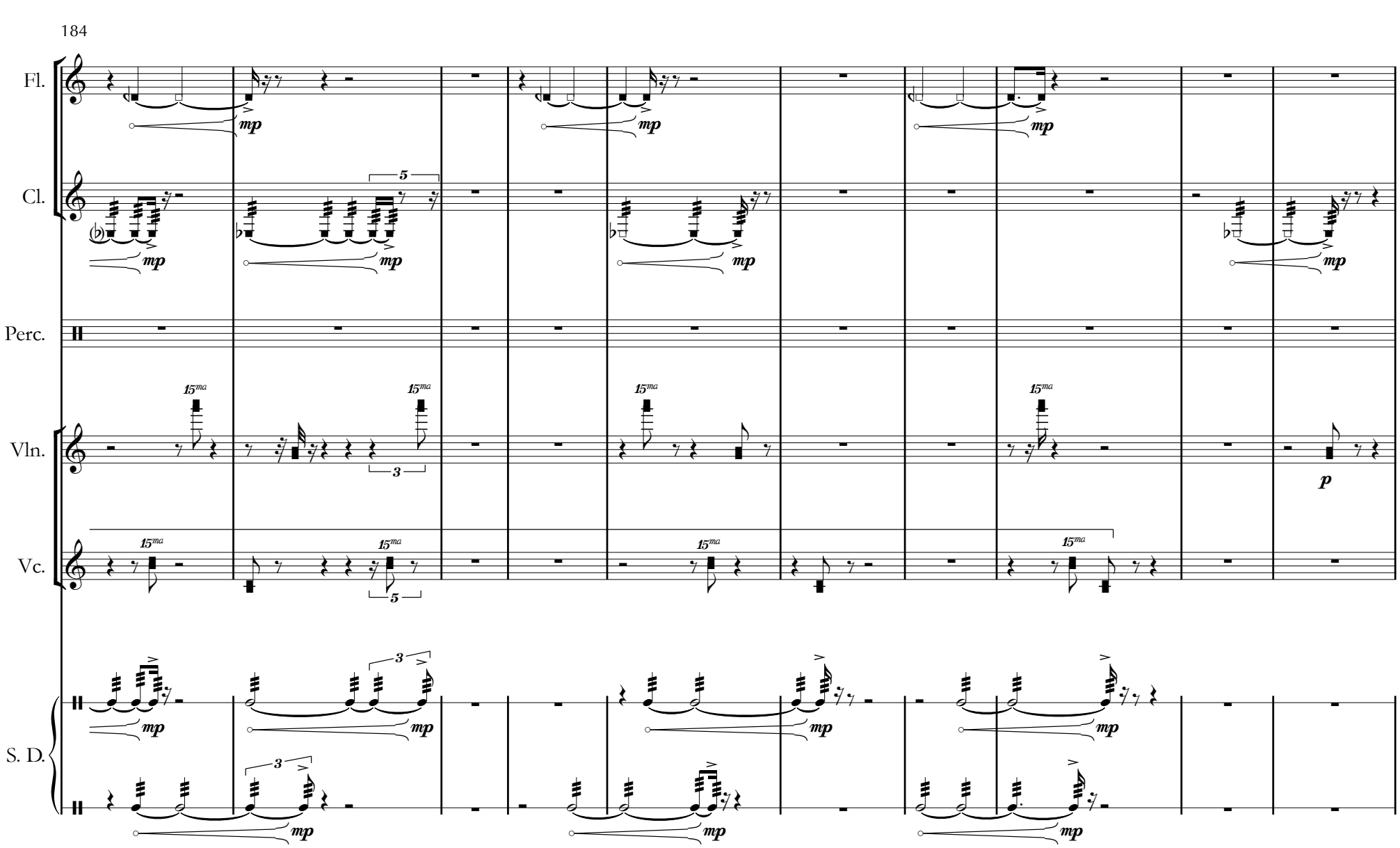

155
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
sim.
arco
I
I + II
CL Bat
Jeté
IV
CL Bat
Jeté
I
on binding

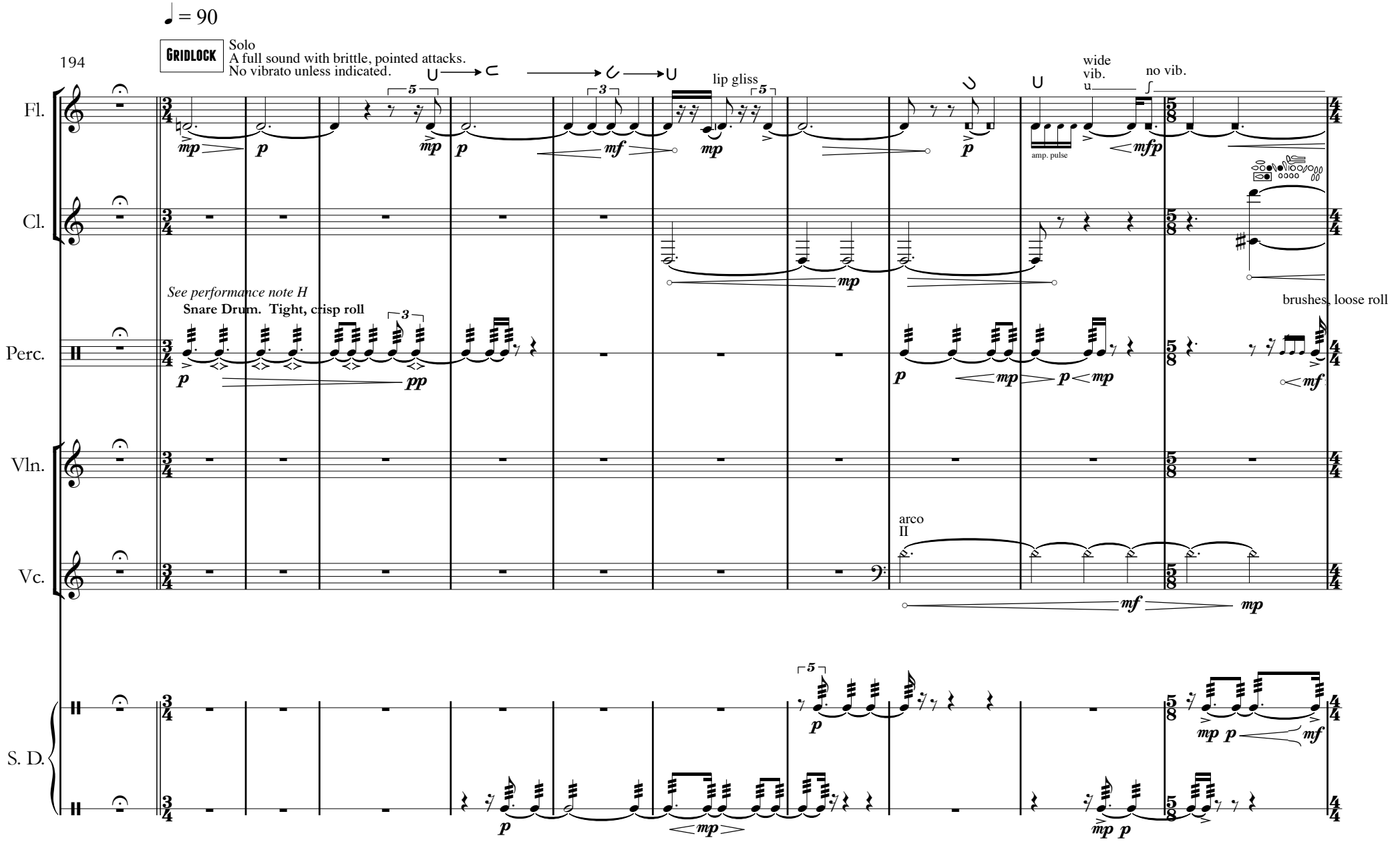

162
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
t k t
"fff"
mp < mf
slightly smeared
sempre "fff"
grace note not slurred
ffp
ff
snares off
jété, near rim
snare, mf kickdrum
nail pizz, brittle
I
on binding
II
III
jété
arco MSP distorted
ossia: artificial harmonic on F5

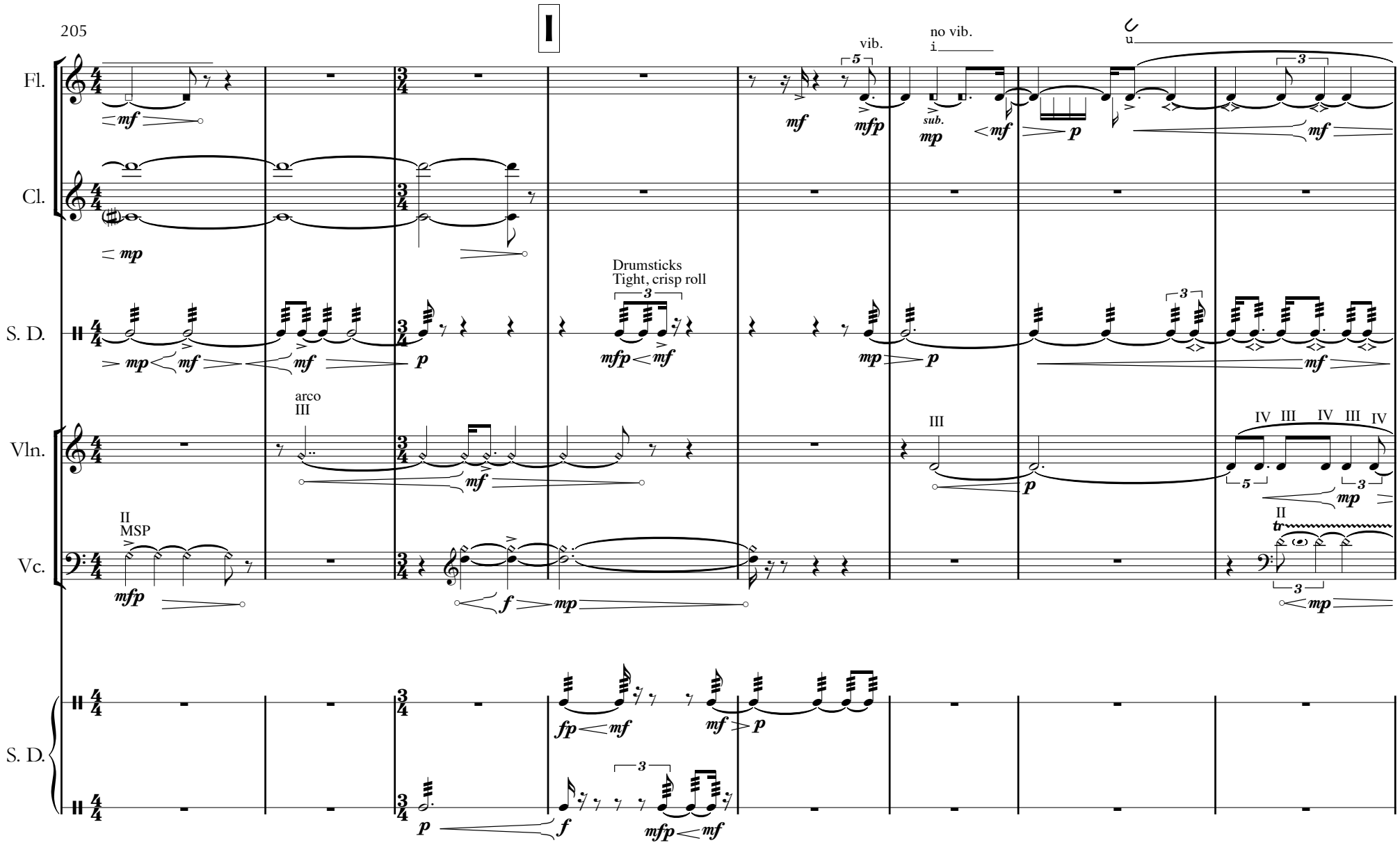

167
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
II
sim. strings
sim.
strings/techniques
t k t
t k t

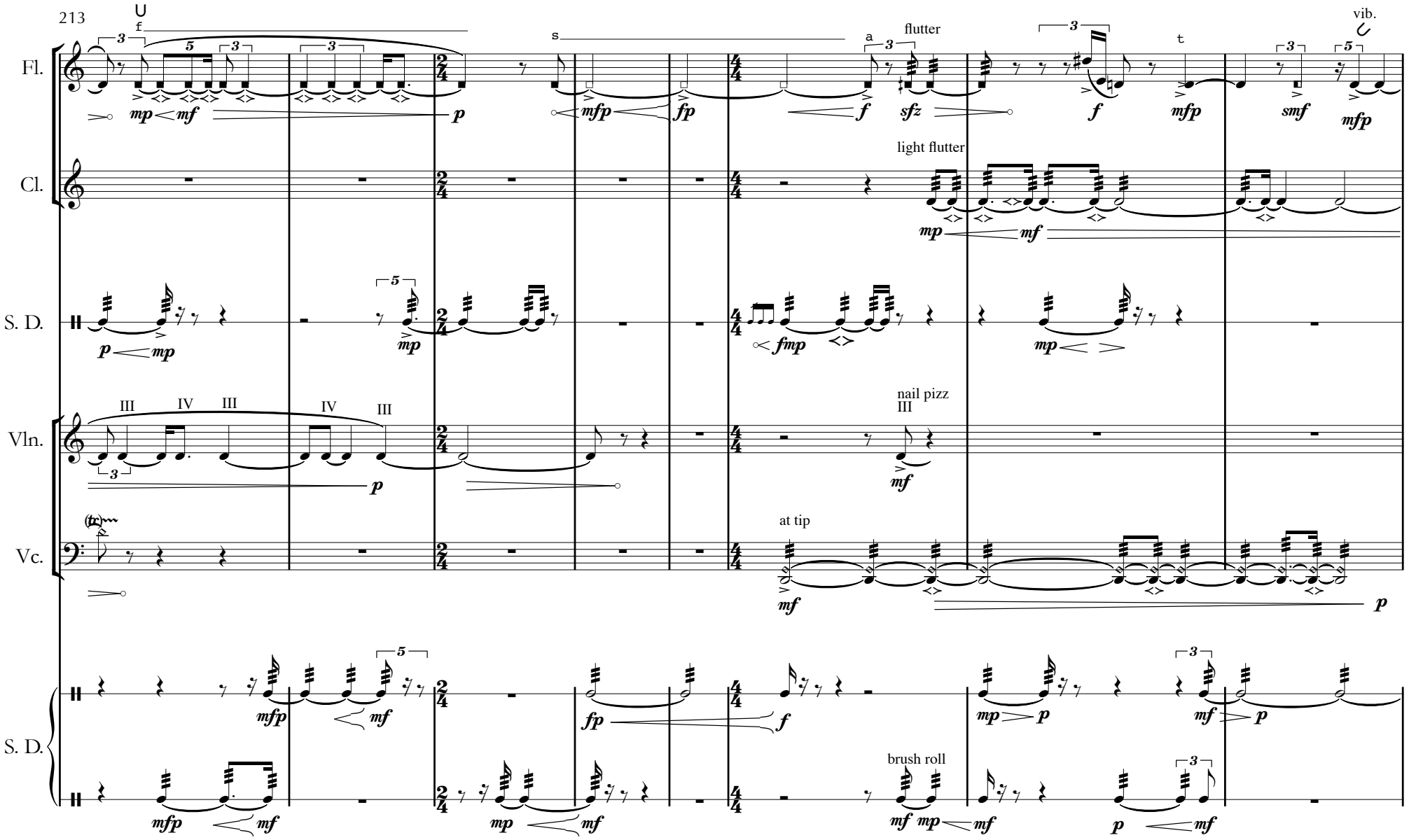

172
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
t k t
mp
f
ffp
ff
p
mf

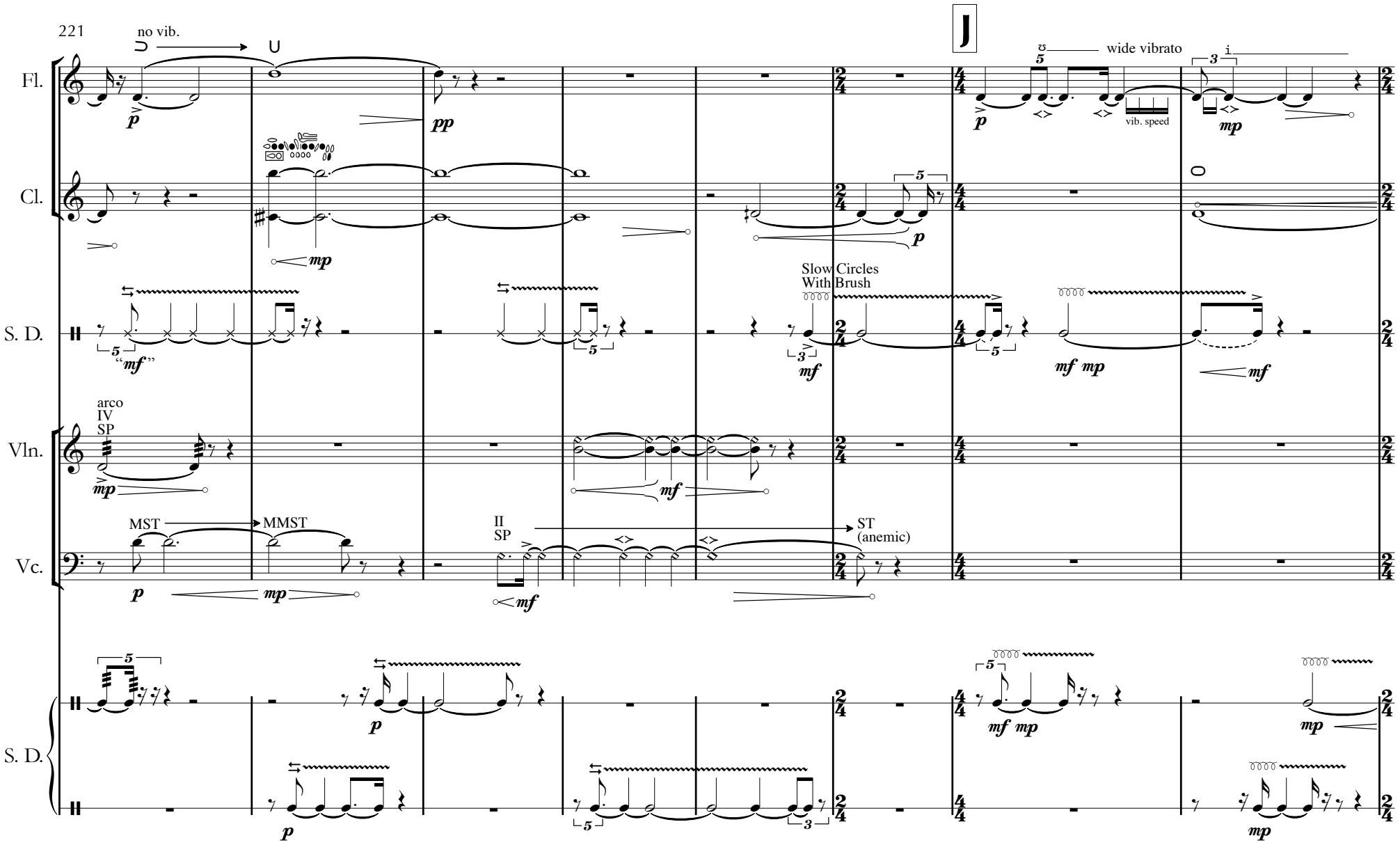

177
H
t k t
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
pizz
I
III
15ma

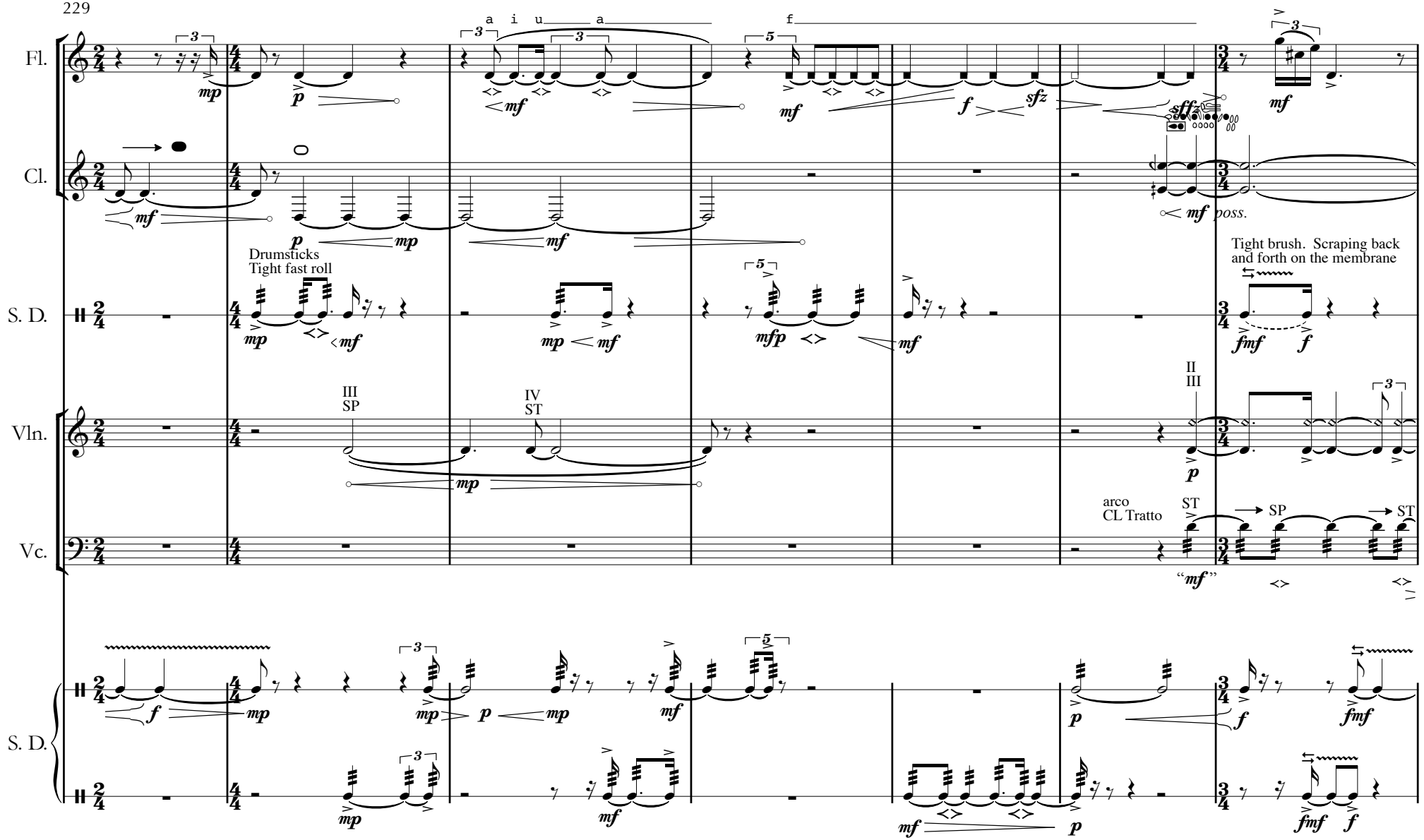

184
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
mp
p
15ma
3
5

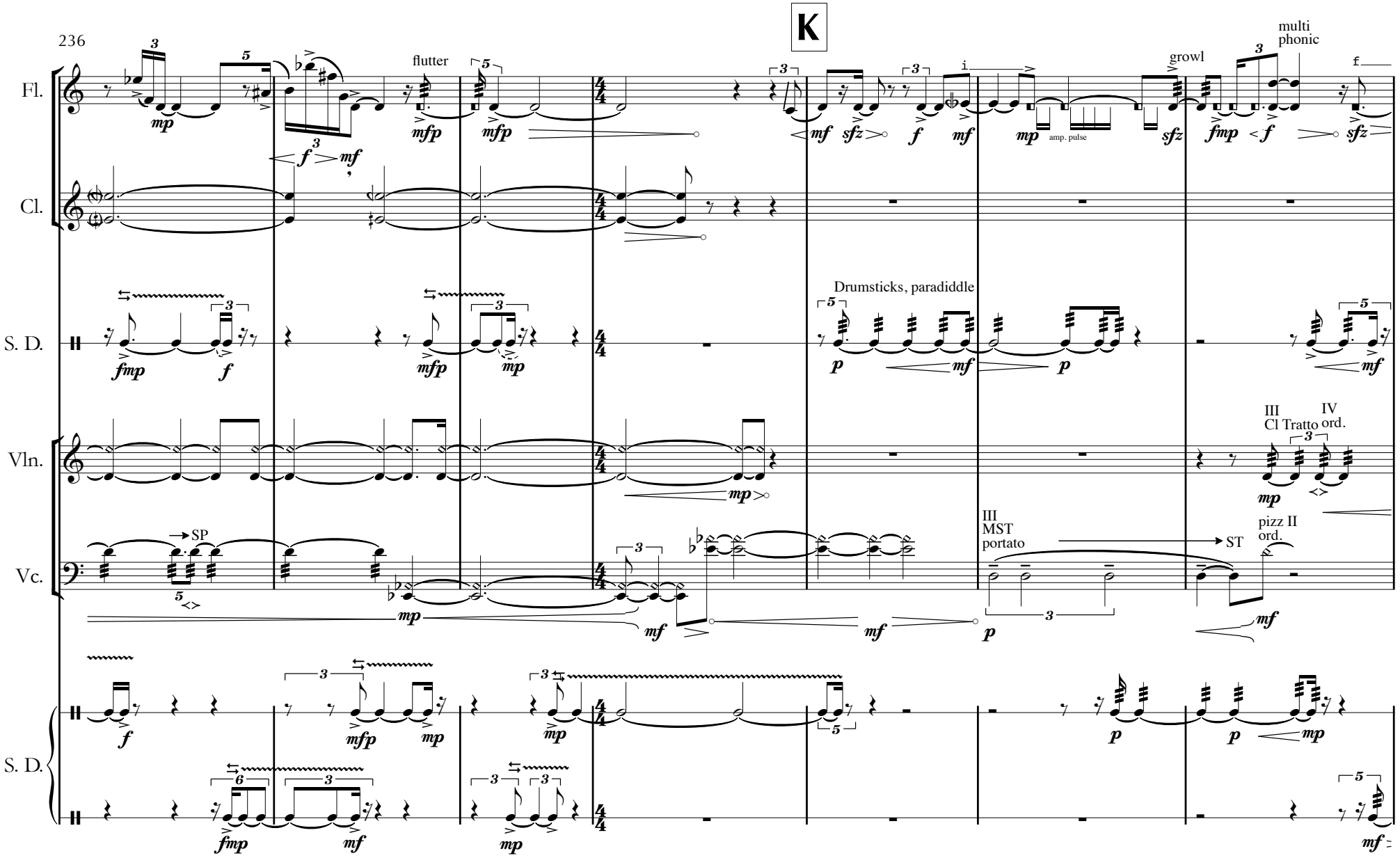

♩ = 90
194
GRIDLOCK
Solo
A full sound with brittle, pointed attacks.
No vibrato unless indicated.
lip gliss
wide vib.
no vib.
amp. pulse
Fl.
Cl.
See performance note H
Snare Drum. Tight, crisp roll
brushes, loose roll
Perc.
Vln.
arco
II
Vc.
S. D.

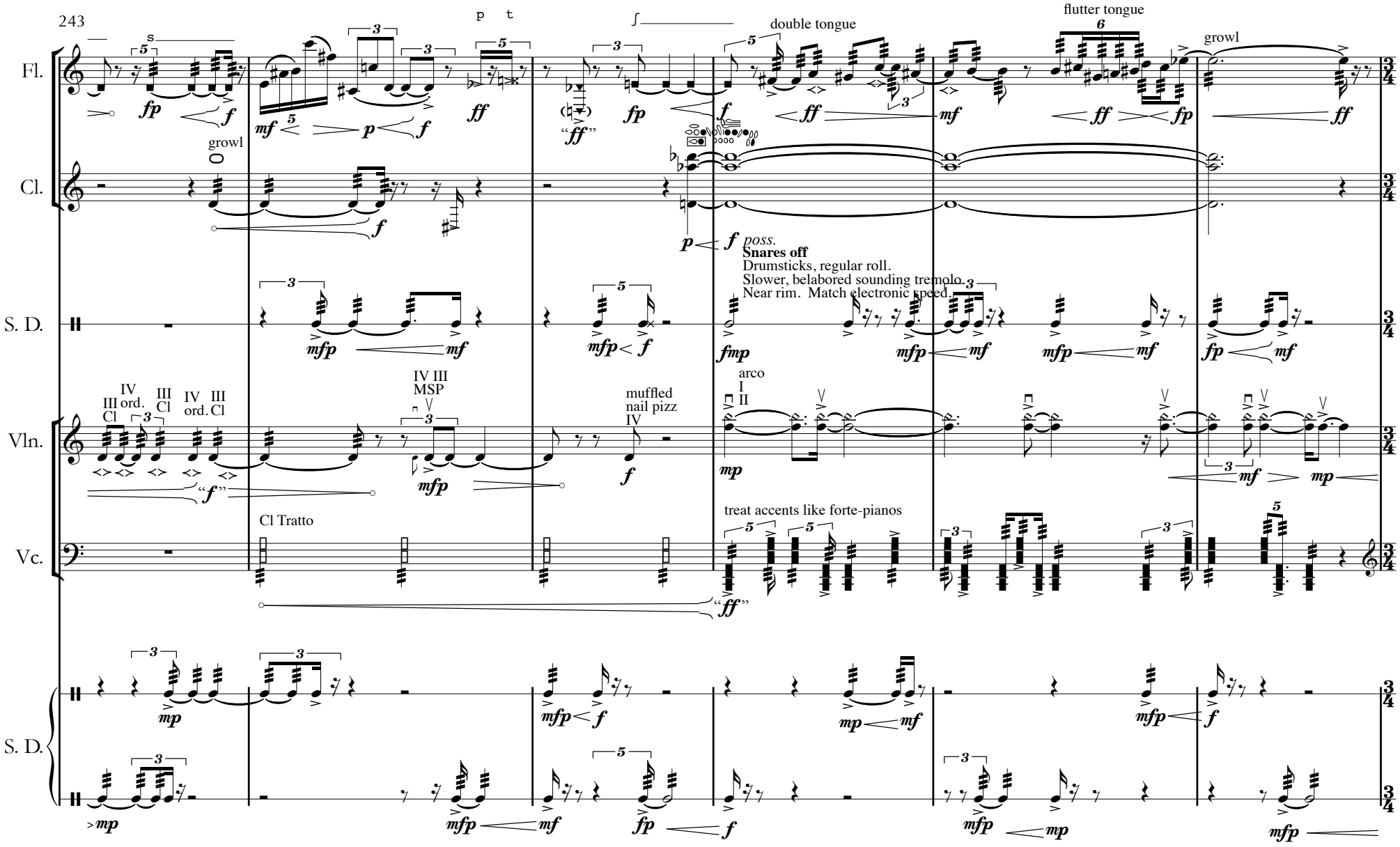

205
I
Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
vib.
no vib.
sub.
Drumsticks
Tight, crisp roll
arco
III
II
MSP
IV III IV III IV
II

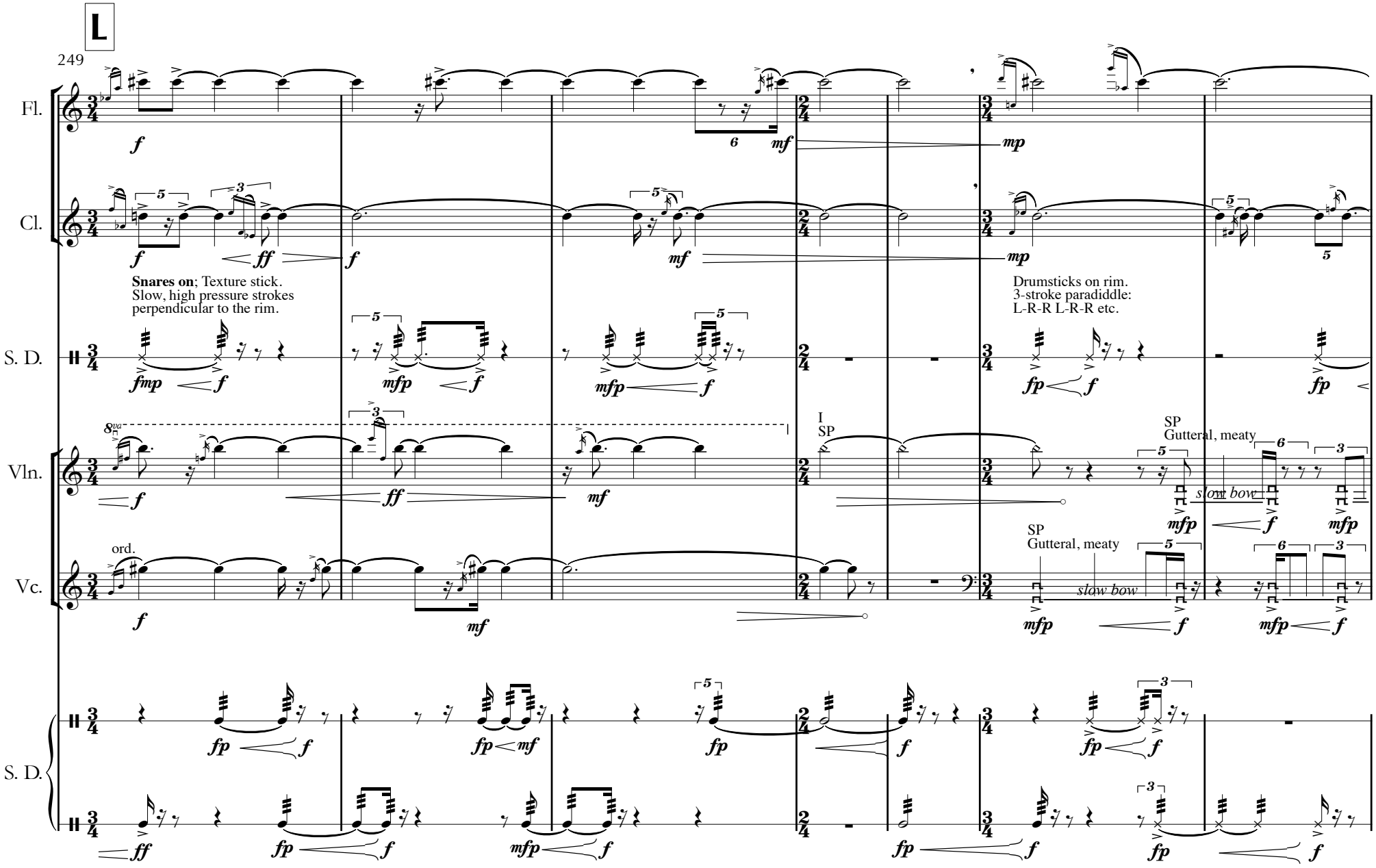

213
Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
flutter
light flutter
nail pizz
at tip
brush roll
vib.

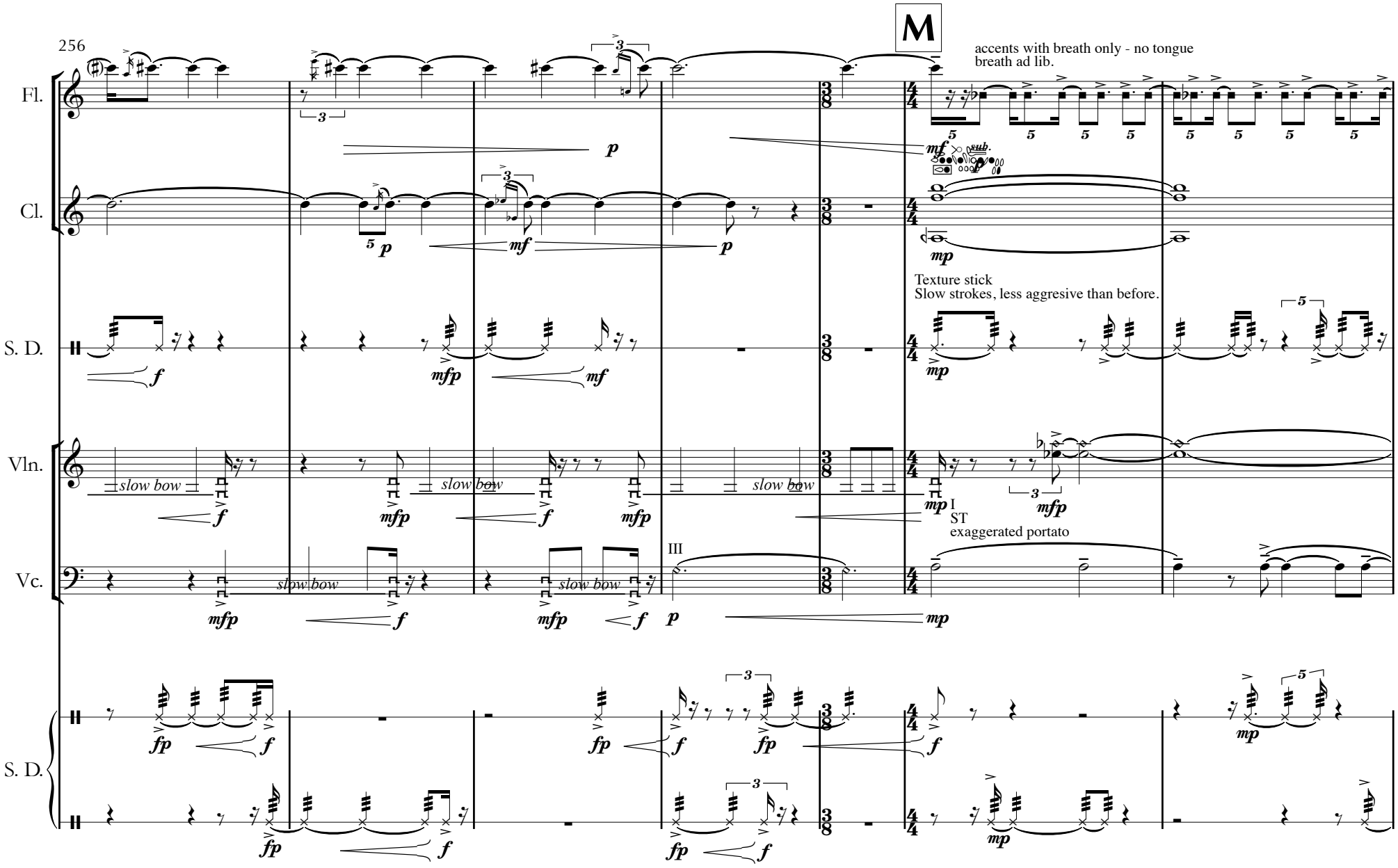

221
no vib.
J
wide vibrato
vib. speed
Fl.
Cl.
S. D.
Slow Circles
With Brush
arco
IV
SP
Vln.
MST
MMST
II
SP
ST
(anemic)
Vc.
S. D.

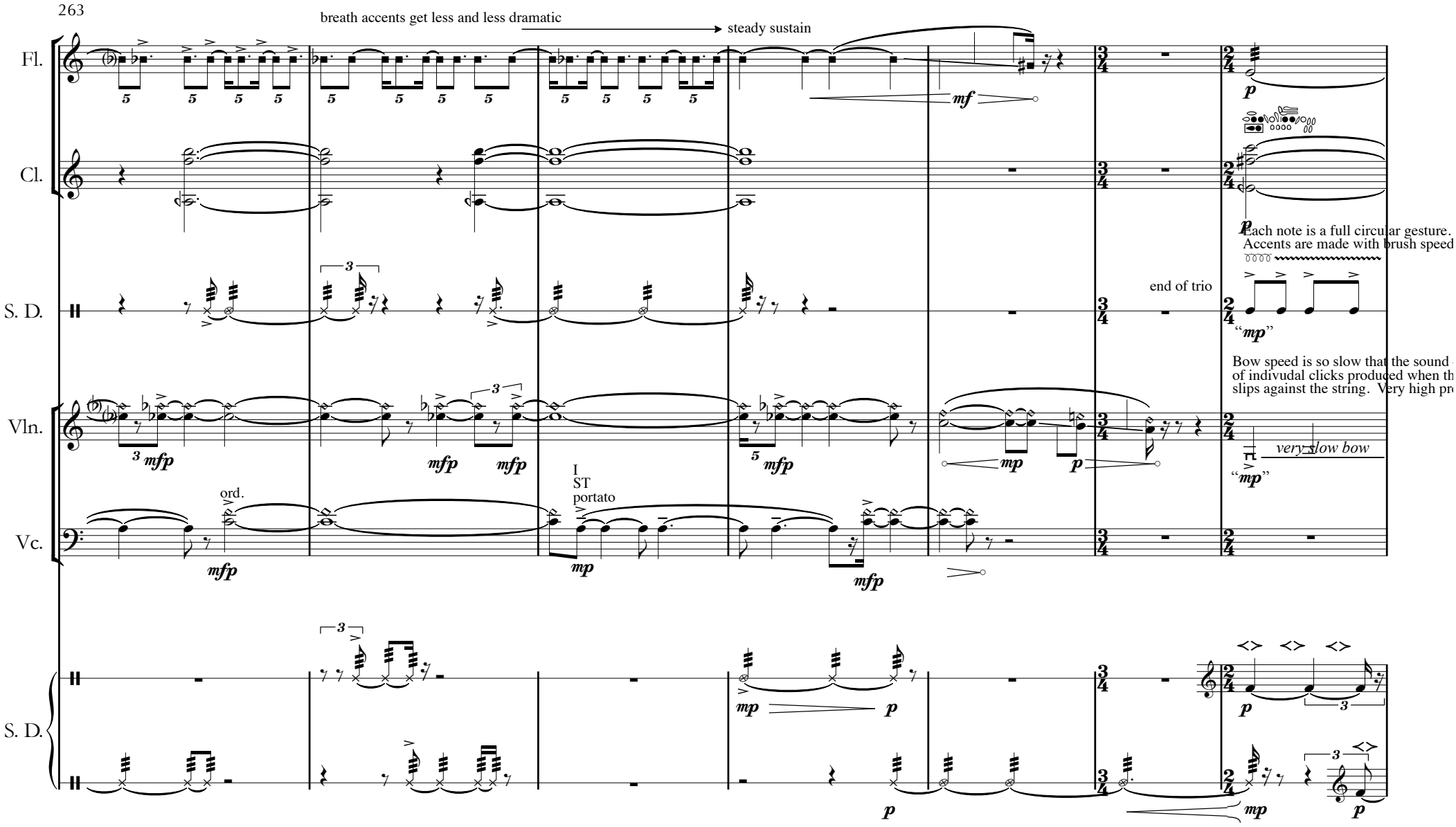

Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
a i u a
f
Drumsticks
Tight fast roll
III
SP
IV
ST
II
III
Tight brush. Scraping back and forth on the membrane
arco
CL Tratto
ST
SP
ST
poss.

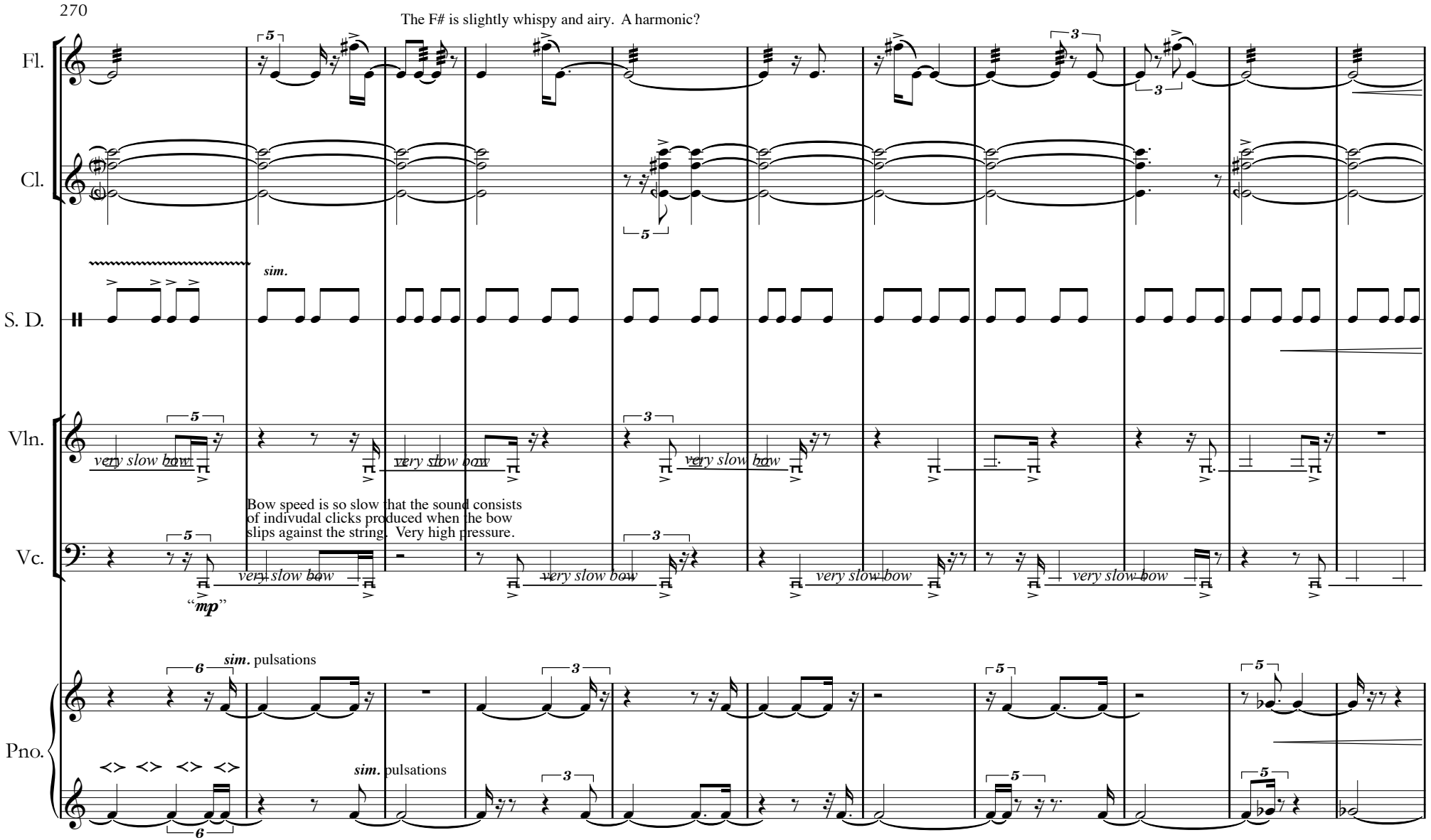

236
K
Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
flutter
growl
multi
phonic
amp. pulse
Drumsticks, paradiddle
III
Cl Tratto
IV
ord.
SP
III
MST
portato
ST
pizz II
ord.

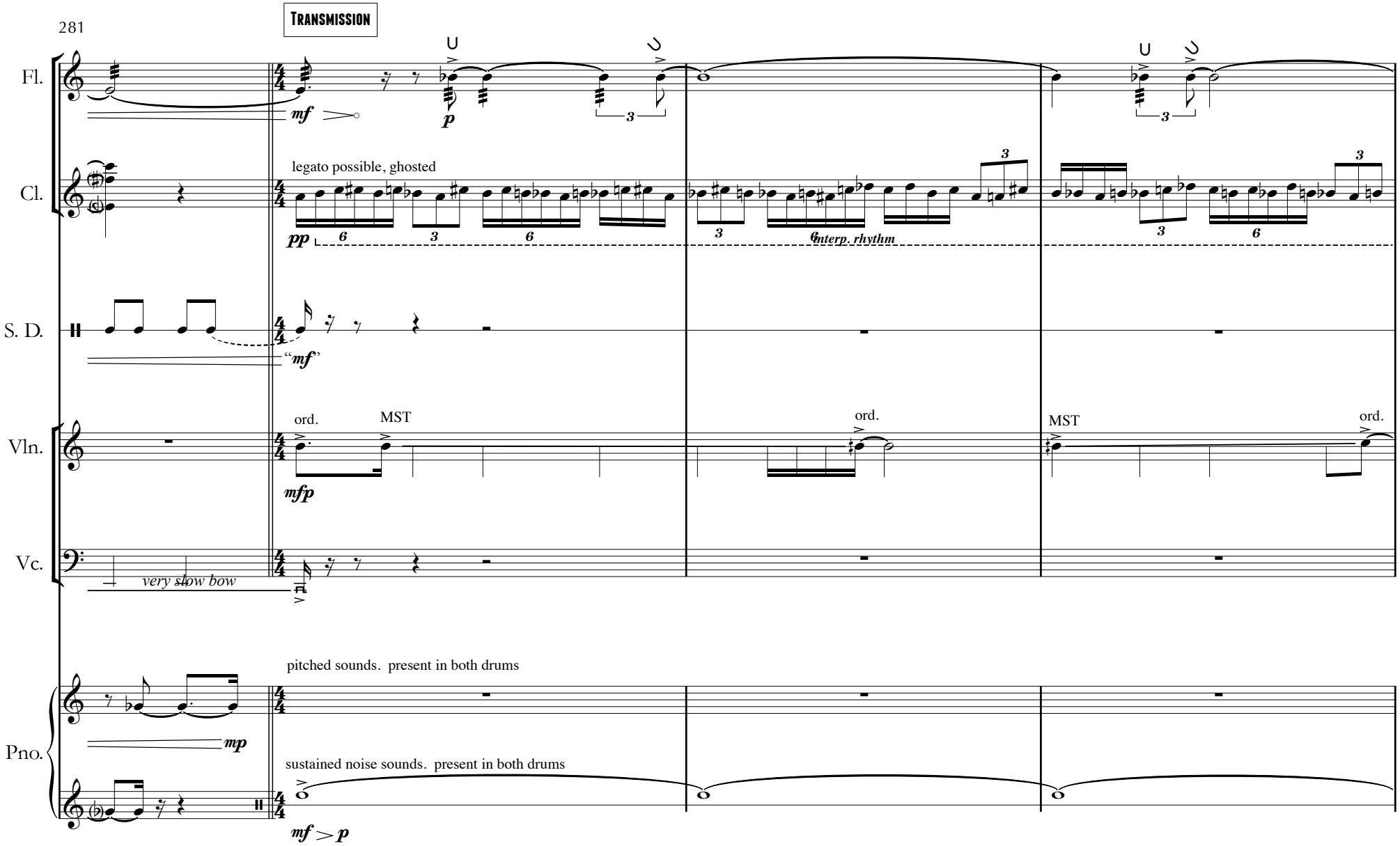

243
Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
growl
double tongue
flutter tongue
growl
poss.
Snares off
Drumsticks, regular roll.
Slower, belabored sounding tremolo.
Near rim. Match electronic speed.
IV III Cl ord. III Cl
IV III MSP
muffled nail pizz IV
arco I II
Cl Tratto
treat accents like forte-pianos

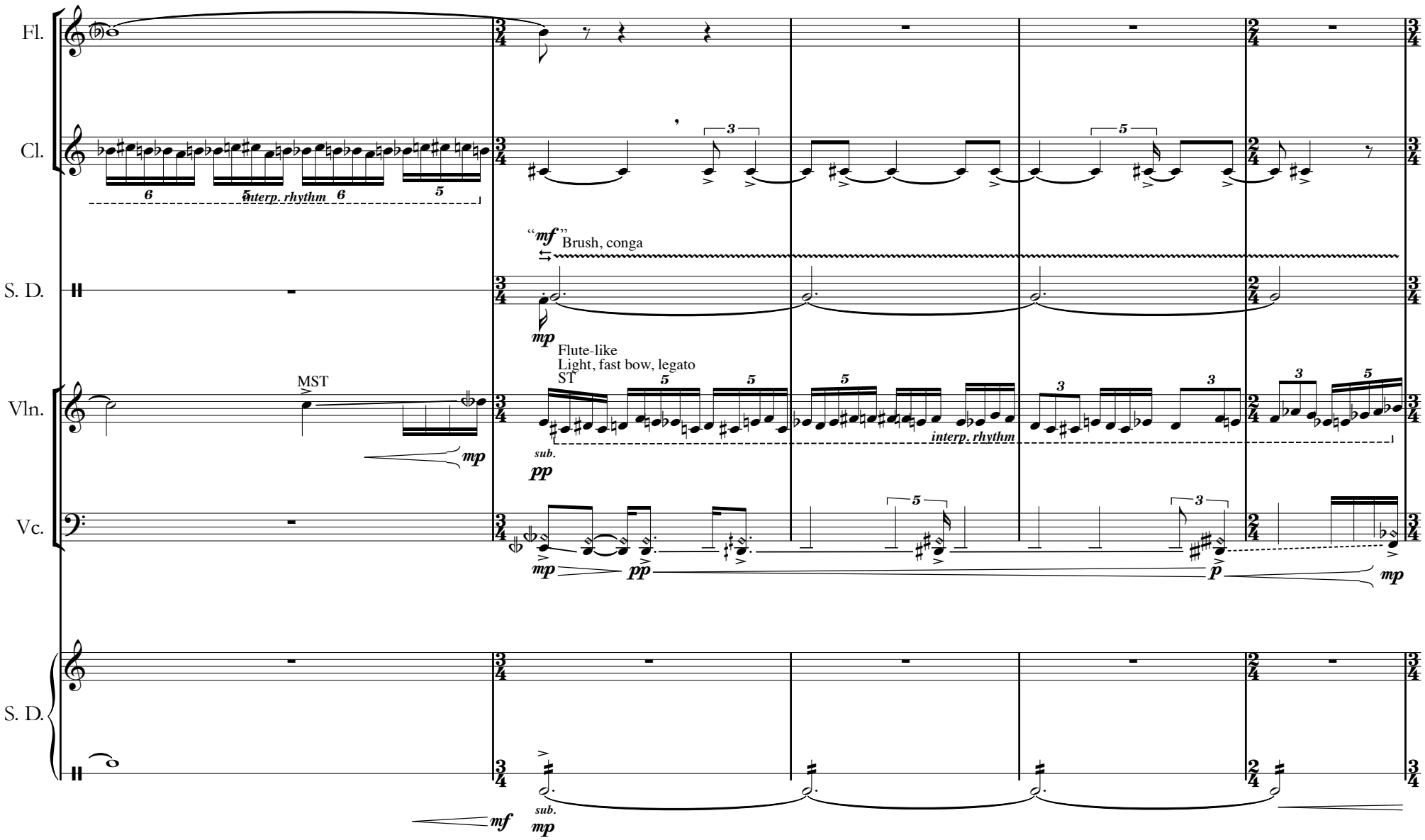

L
249
Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
Snares on; Texture stick.
Slow, high pressure strokes
perpendicular to the rim.
Drumsticks on rim.
3-stroke paradiddle:
L-R-R L-R-R etc.
I
SP
SP
Gutteral, meaty
slow bow
ord.
SP
Gutteral, meaty
slow bow

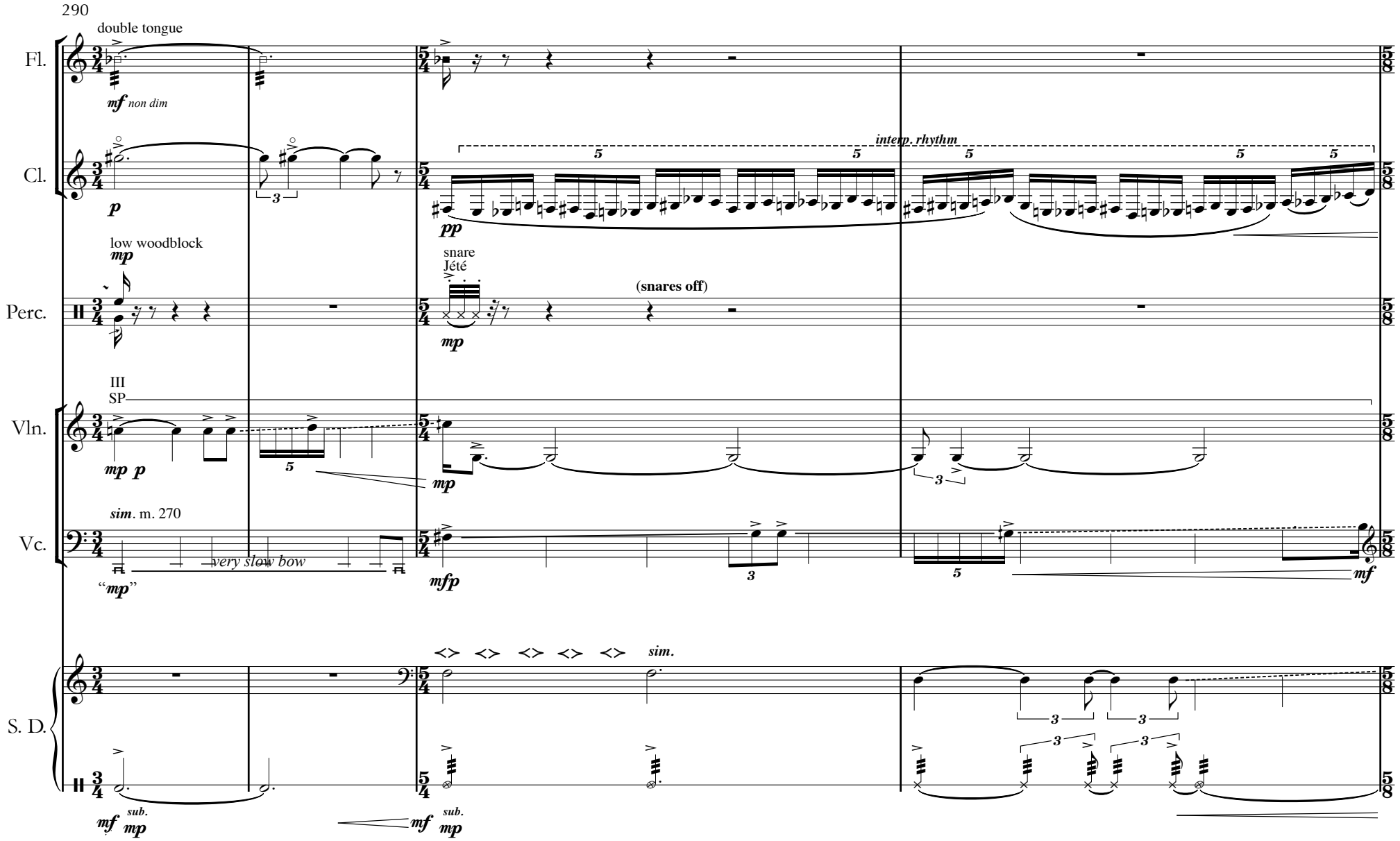

256
M
accents with breath only - no tongue
breath ad lib.
Fl.
Cl.
S. D.
Texture stick
Slow strokes, less aggresive than before.
Vln.
slow bow
I
ST
exaggerated portato
Vc.
III
S. D.

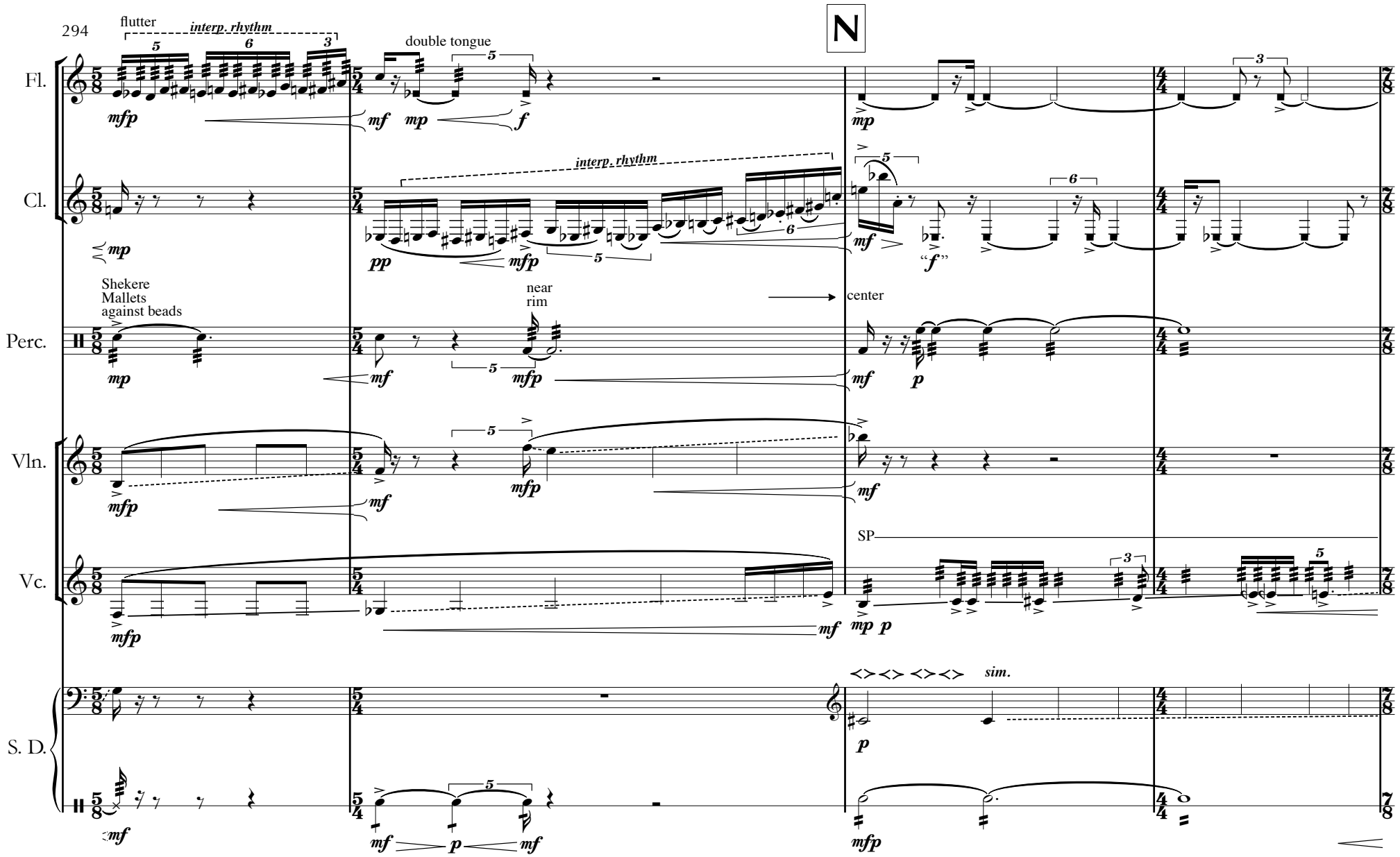

263
breath accents get less and less dramatic
steady sustain
Fl.
Cl.
S. D.
Vln.
Vc.
S. D.
end of trio
Each note is a full circular gesture.
Accents are made with brush speed
Bow speed is so slow that the sound
of indivudal clicks produced when th
slips against the string. Very high pr
very slow bow
ord.
I
ST
portato

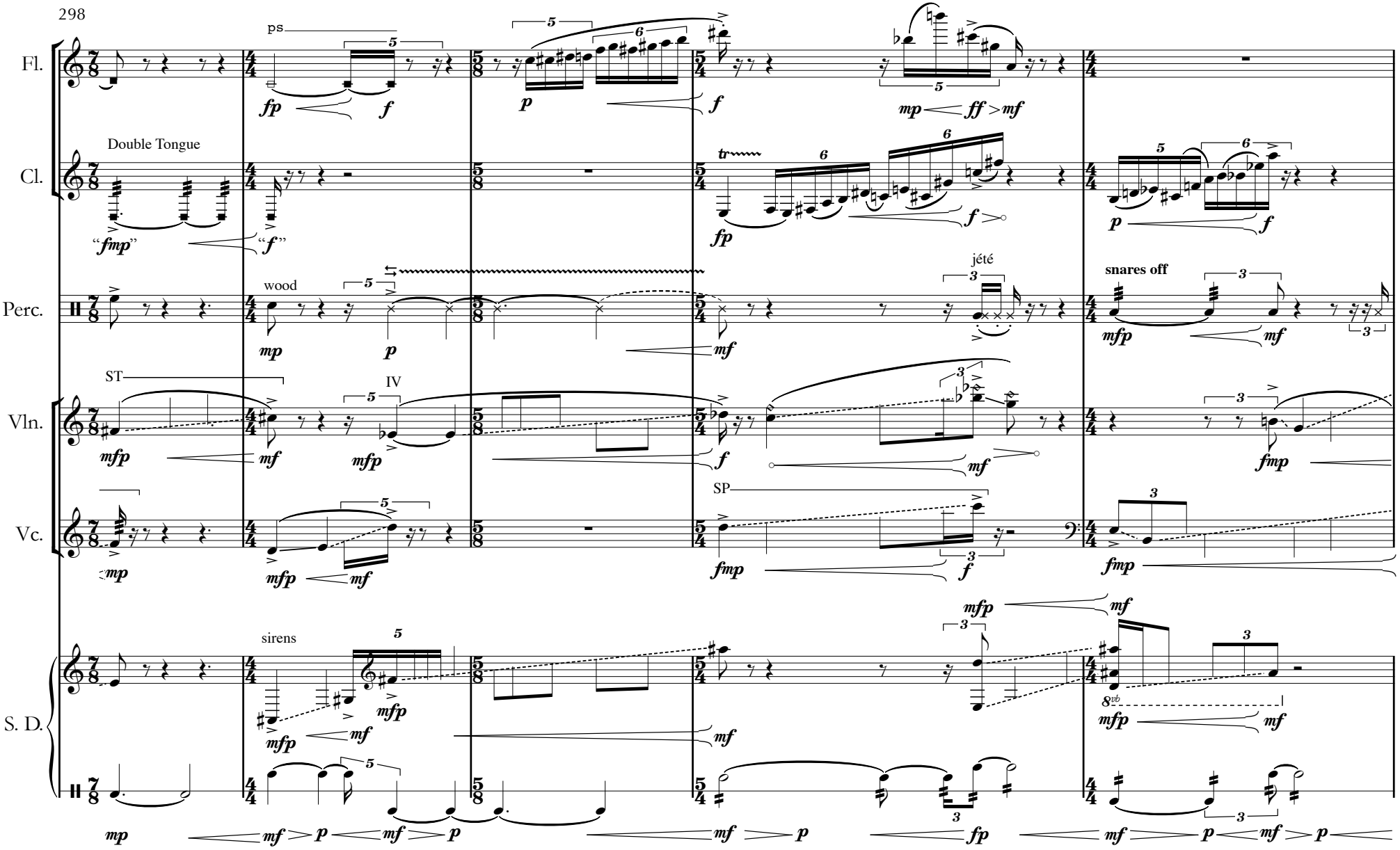

270
The F# is slightly whispy and airy. A harmonic?
Fl.
Cl.
S. D.
sim.
Vln.
very slow bow
very slow bow
very slow bow
Bow speed is so slow that the sound consists of indivudal clicks produced when the bow slips against the string. Very high pressure.
Vc.
very slow bow
very slow bow
very slow bow
very slow bow
"mp"
Pno.
sim. pulsations
sim. pulsations

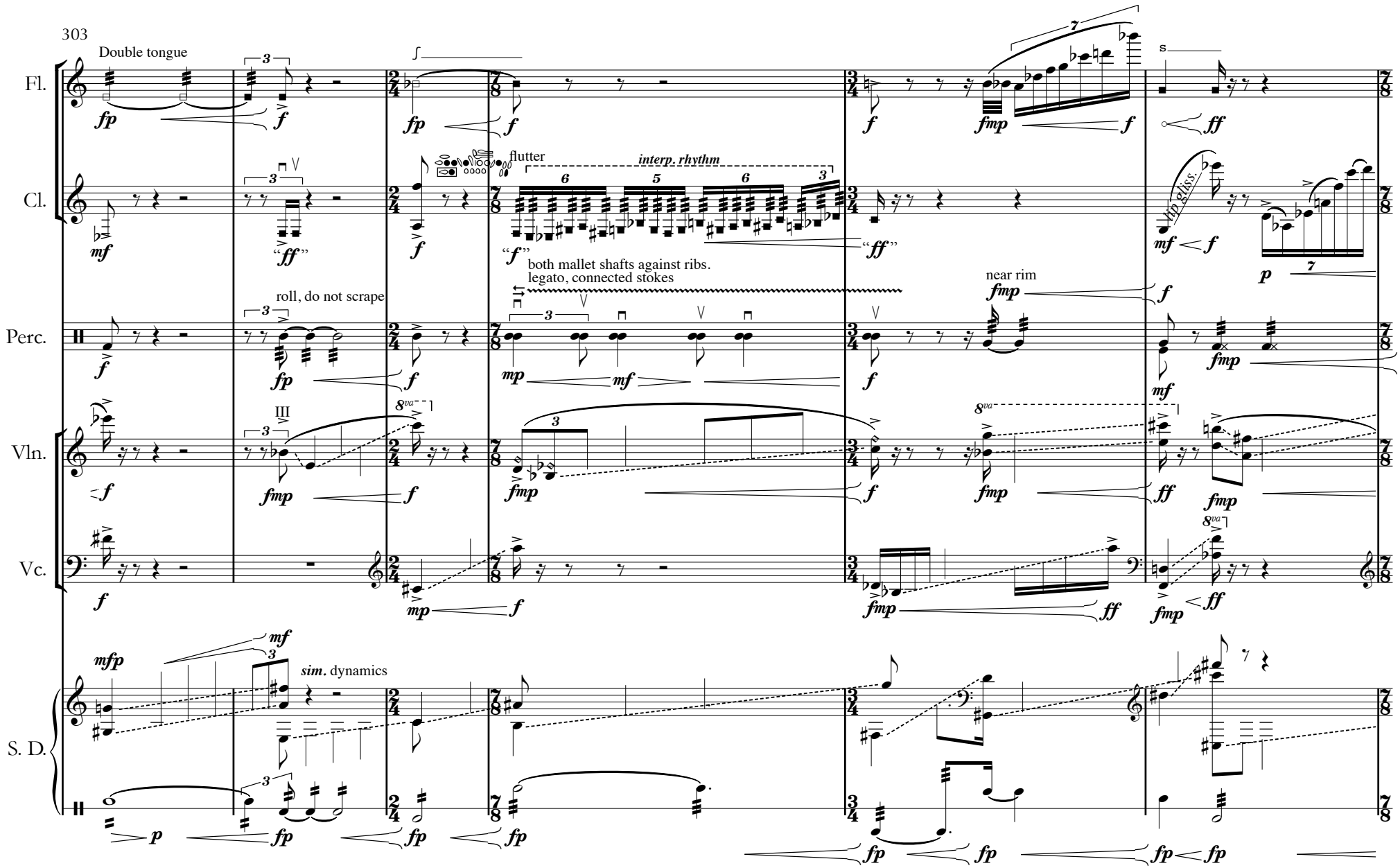

281
TRANSMISSION
Fl.
Cl.
S. D.
Vln.
Vc.
Pno.
mf
p
legato possible, ghosted
pp
interp. rhythm
"mf"
ord.
MST
mfp
very slow bow
pitched sounds. present in both drums
mp
sustained noise sounds. present in both drums
mf > p

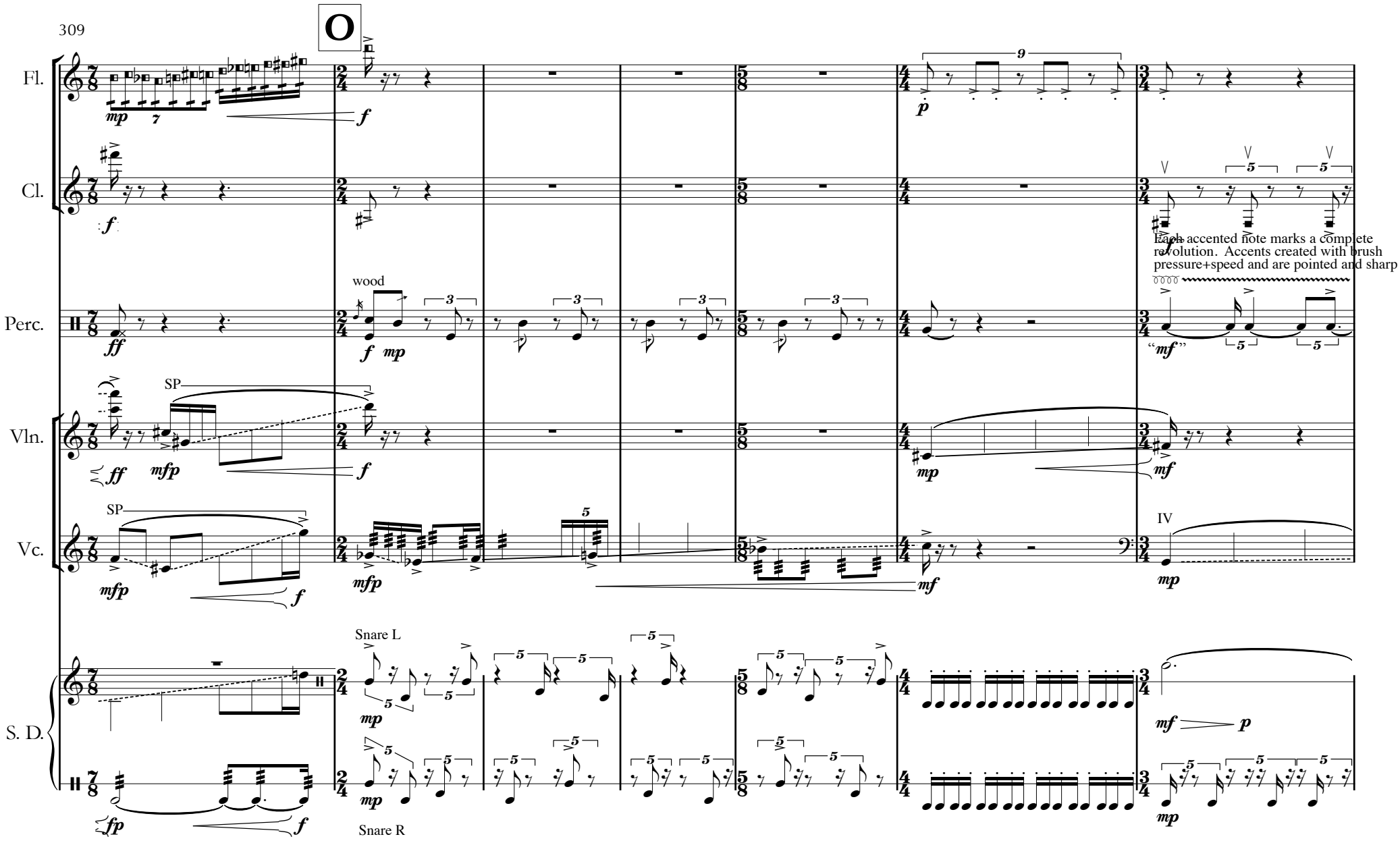

Fl.
Cl.
interp. rhythm
"mf"
Brush, conga
S. D.
mp
Flute-like
Light, fast bow, legato
ST
MST
Vln.
mp
sub.
pp
interp. rhythm
Vc.
mp
pp
p
mp
S. D.
mf
sub.
mp

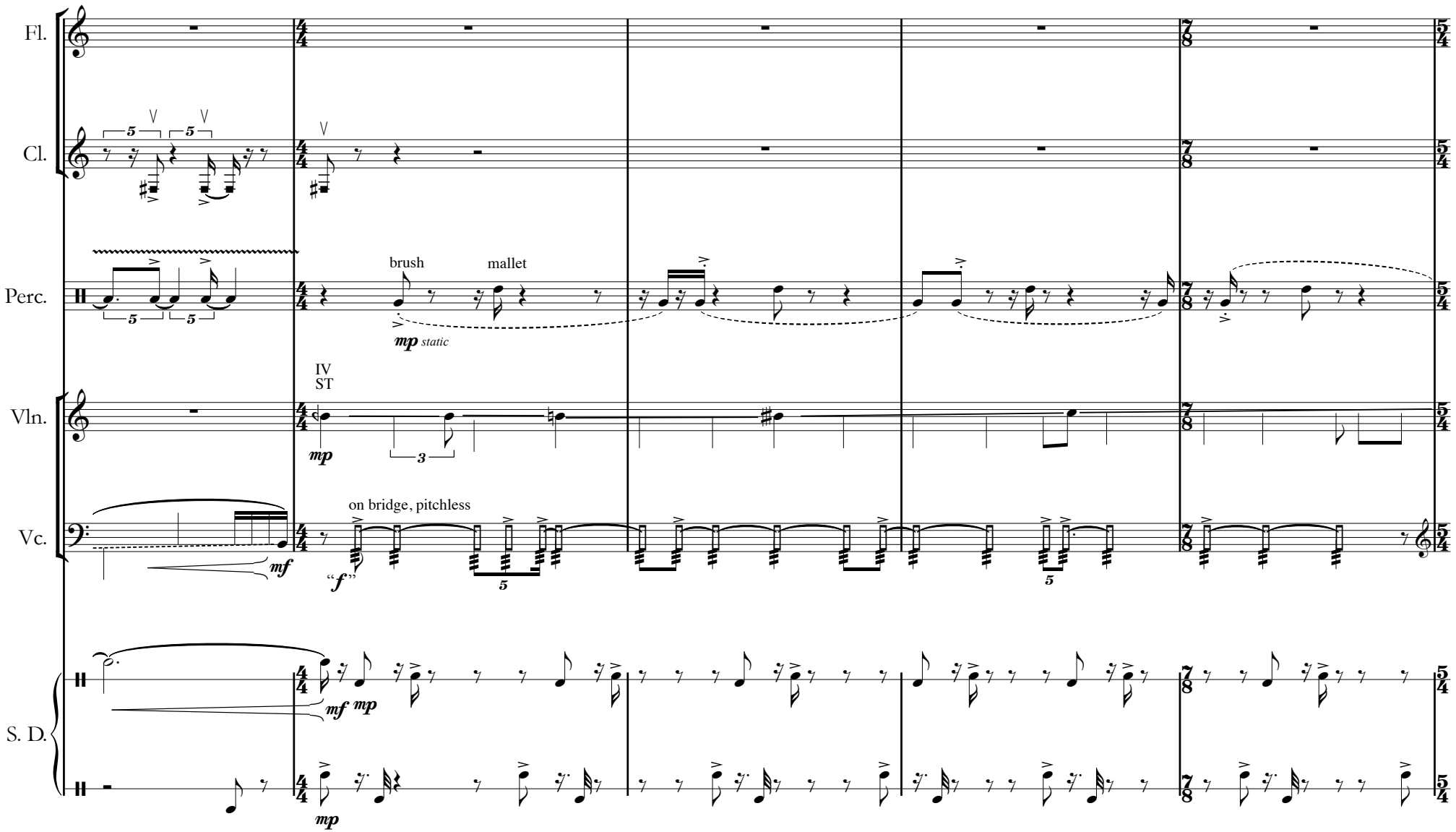

290
double tongue
Fl.
mf non dim
Cl.
p
interp. rhythm
pp
low woodblock
mp
snare
Jété
(snares off)
Perc.
mp
III
SP
Vln.
mp p
mp
sim. m. 270
Vc.
very slow bow
"mp"
mfp
mf
sim.
S. D.
mf sub. mp
mf sub. mp

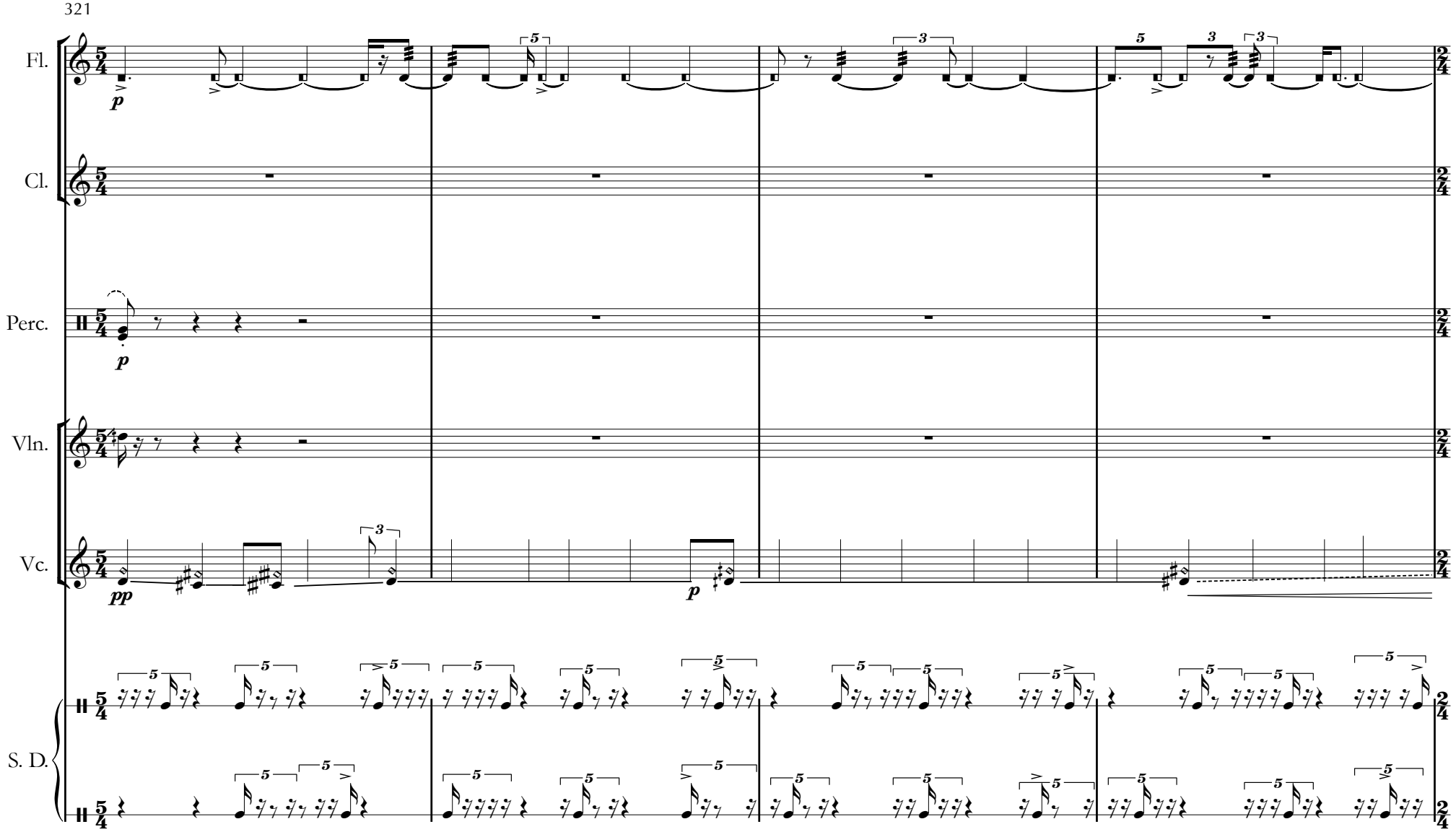

294
flutter
interp. rhythm
double tongue
N
Fl.
Cl.
interp. rhythm
Perc.
Shekere
Mallets
against beads
near
rim
center
Vln.
Vc.
SP
S. D.
sim.

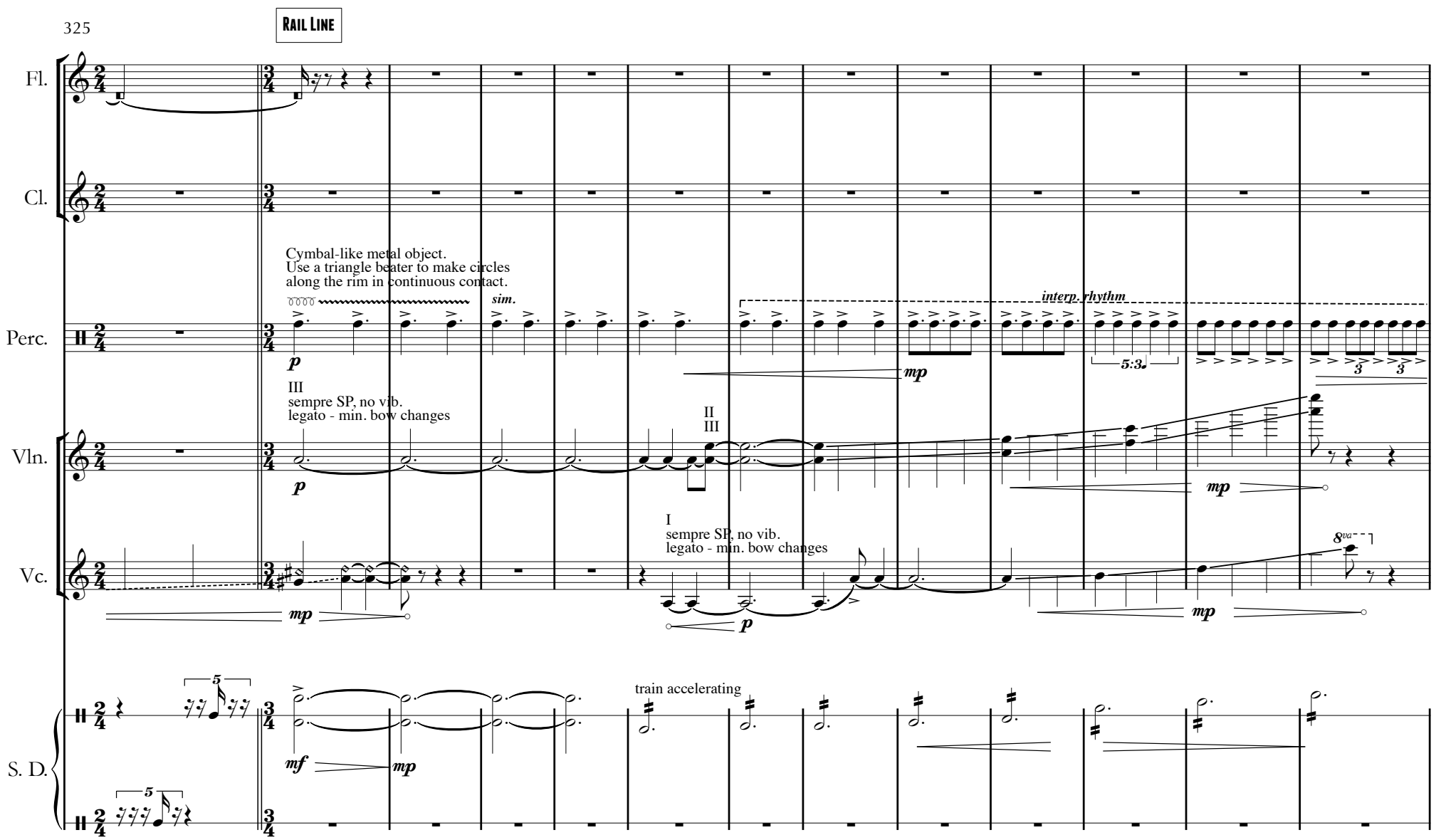

298
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
ps
Double Tongue
wood
ST
IV
sirens
jété
snares off
SP

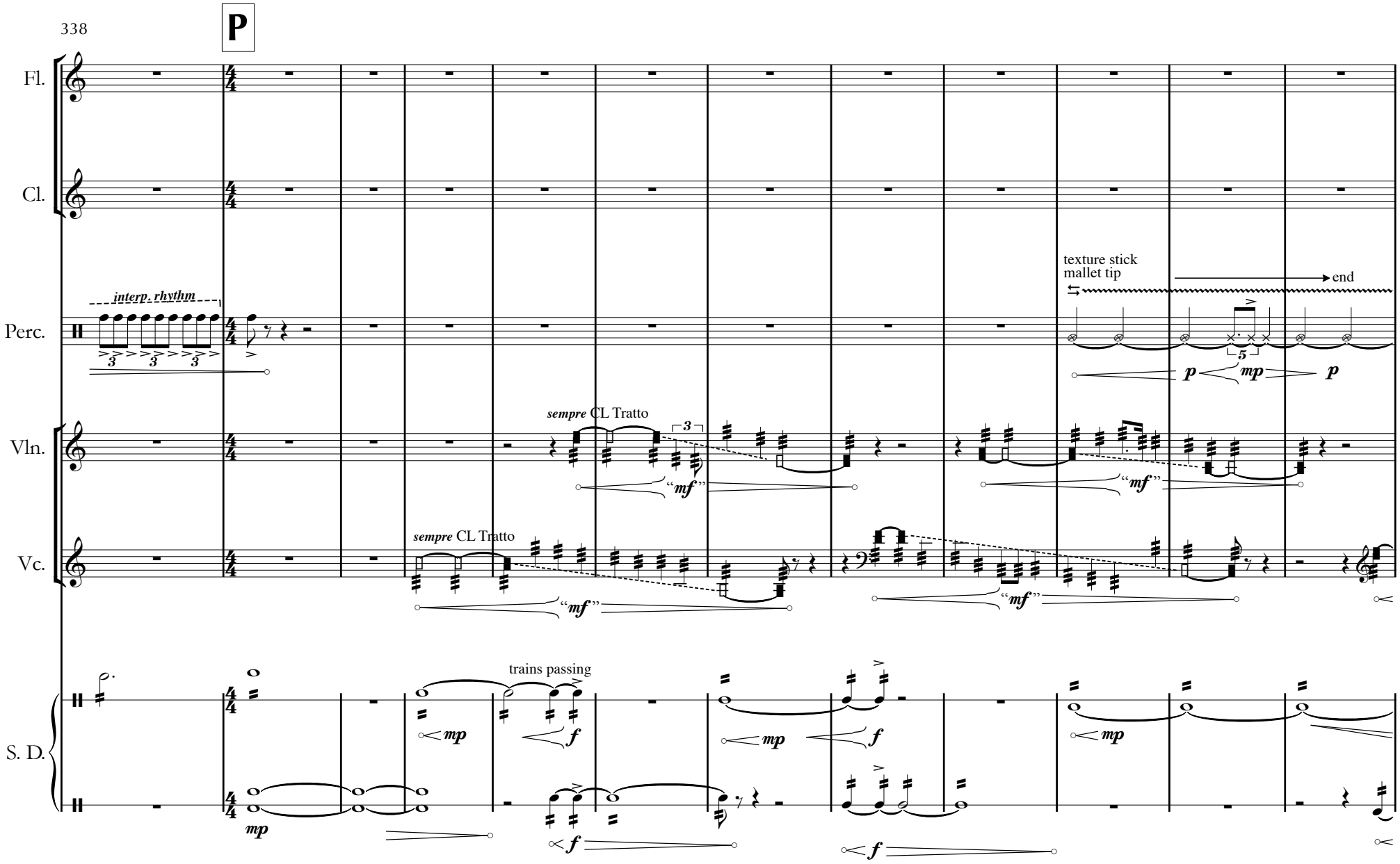

303
Double tongue
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
flutter
interp. rhythm
both mallet shafts against ribs.
legato, connected stokes
roll, do not scrape
near rim
lip gliss.
III
sim. dynamics

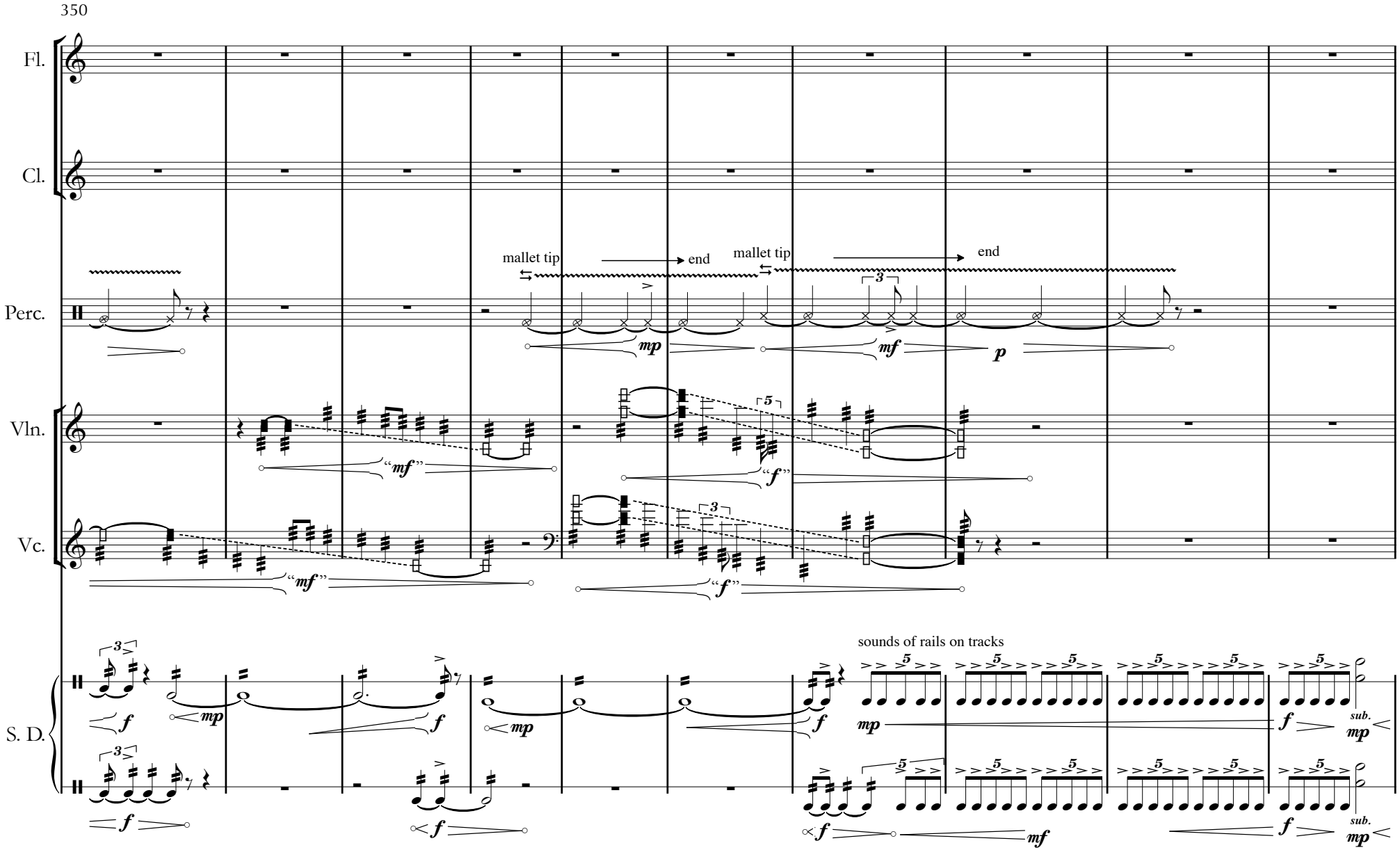

309
O
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
wood
SP
SP
IV
Snare L
Snare R
Each accented note marks a complete revolution. Accents created with brush pressure+speed and are pointed and sharp

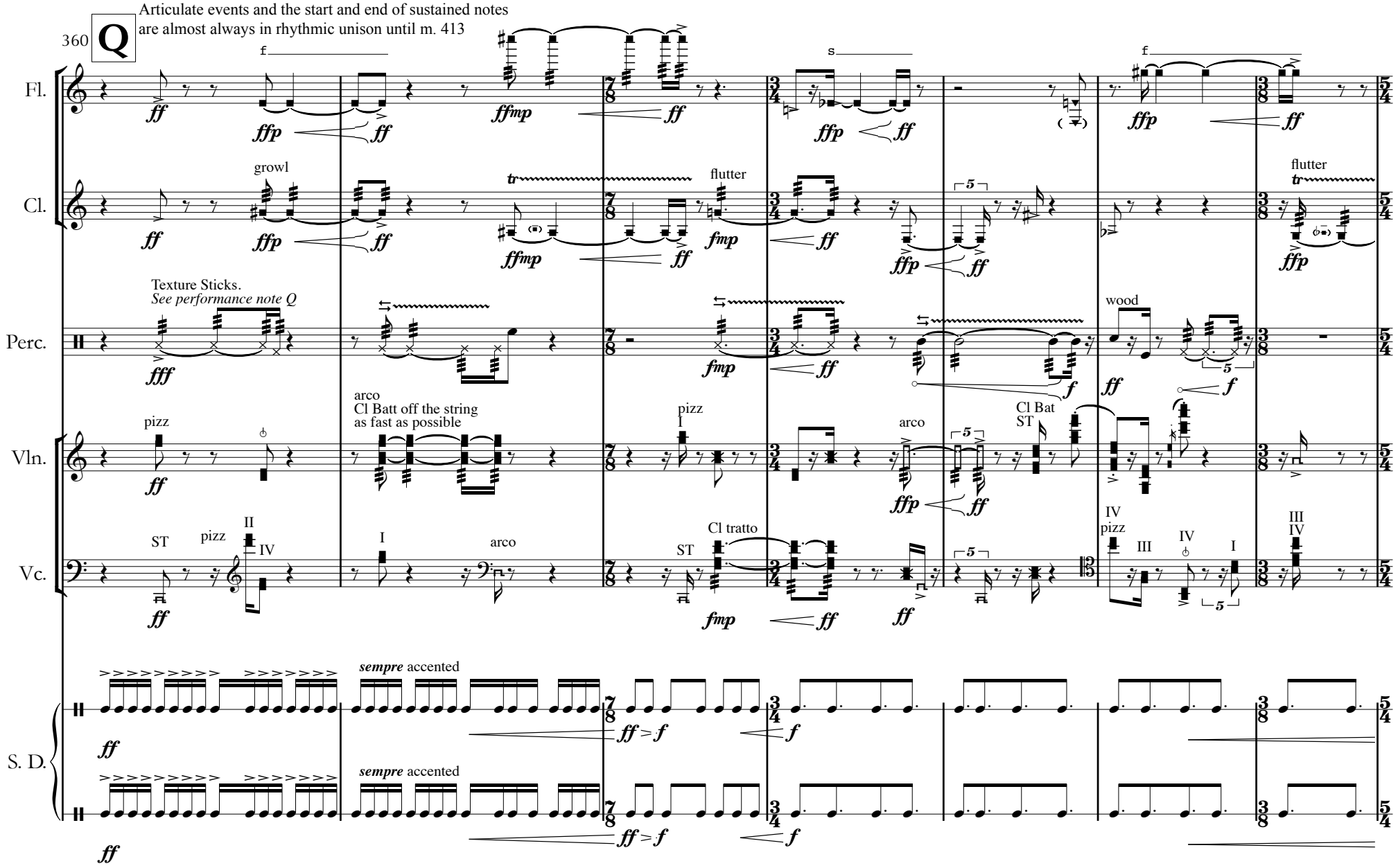

Fl.
Cl.
Perc.
brush
mallet
mp static
IV
ST
Vln.
mp
Vc.
on bridge, pitchless
mf
"f"
S. D.
mf mp
mp

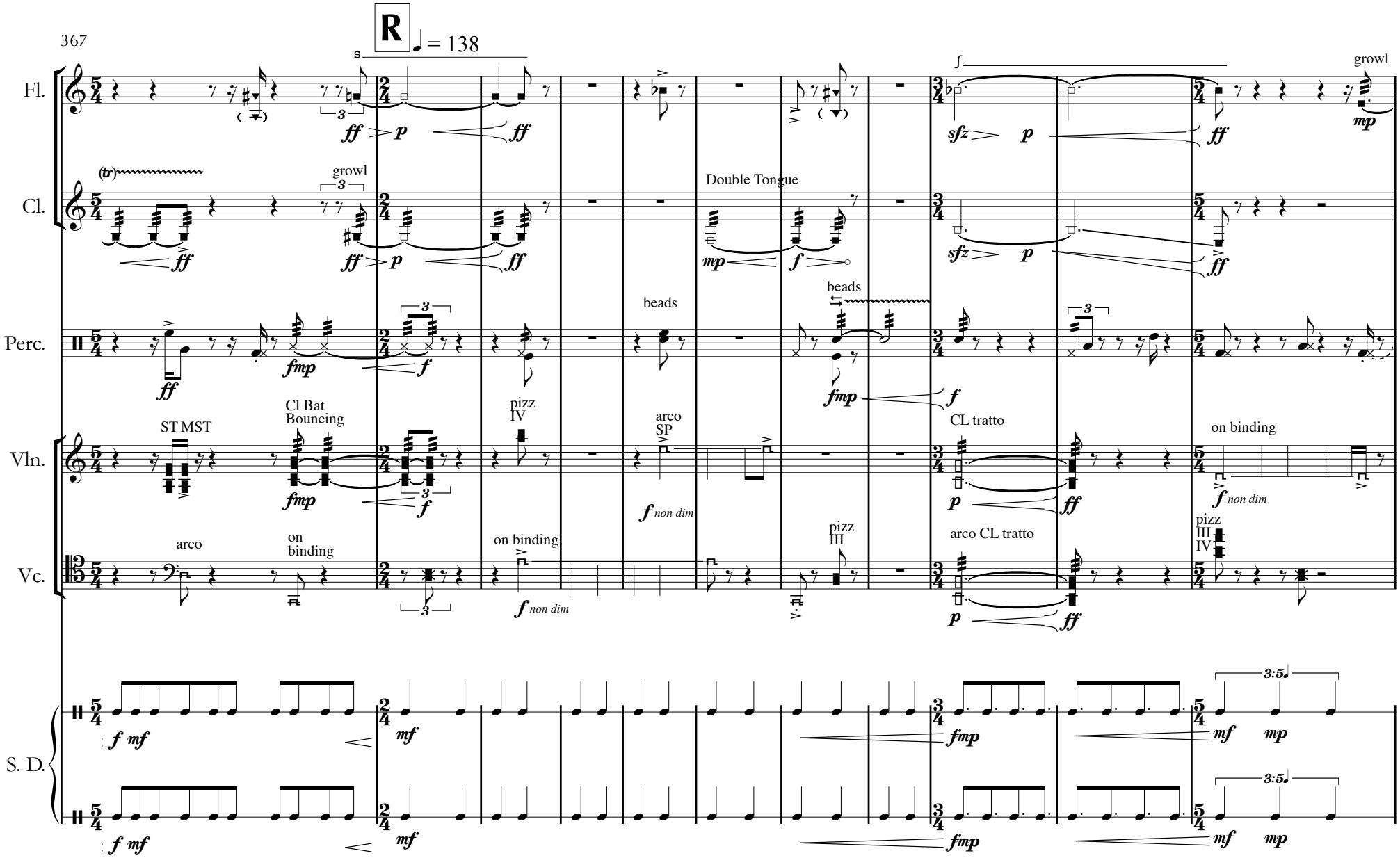

321
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.

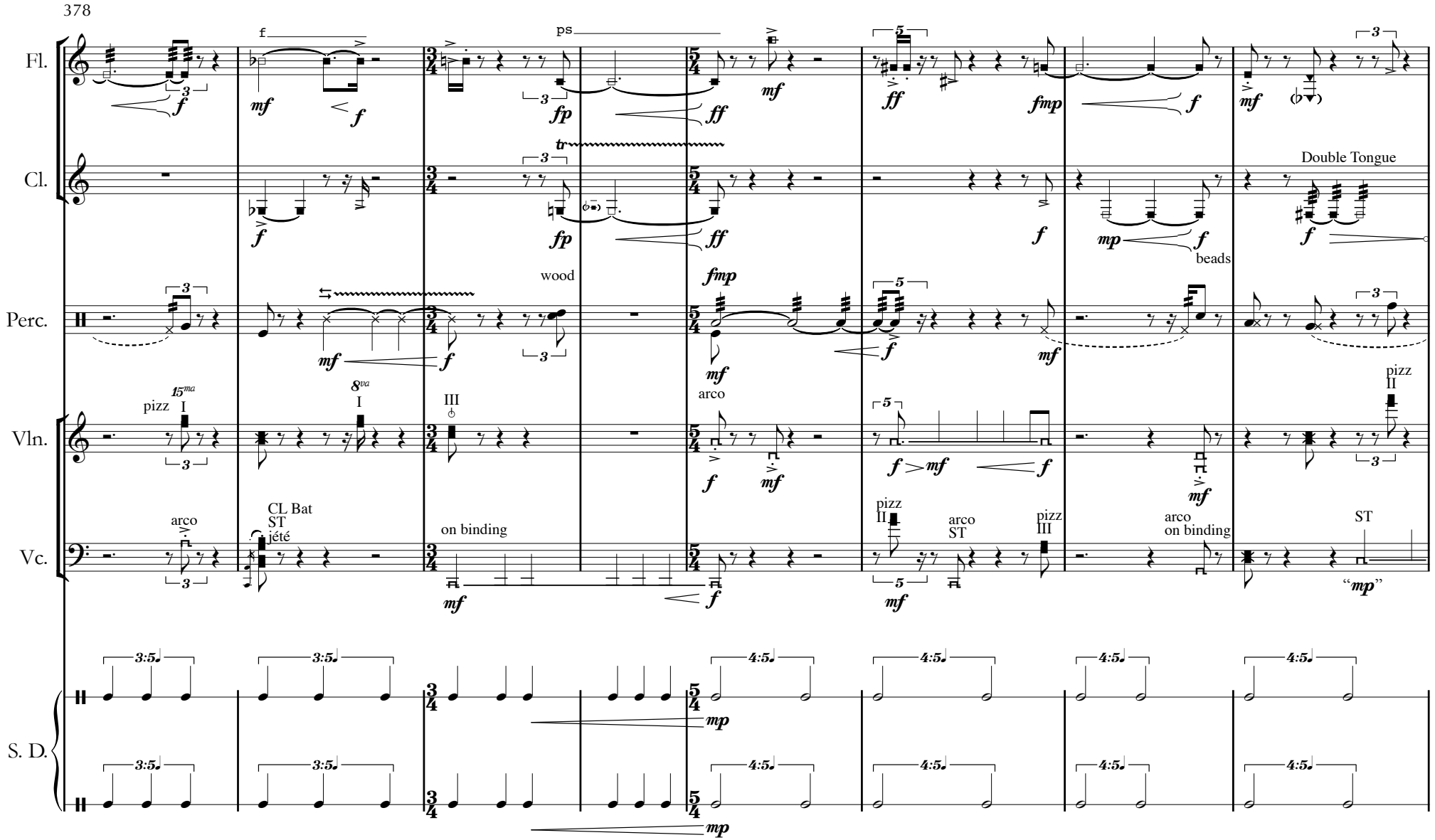

325
Rail Line
Fl.
Cl.
Perc.
Cymbal-like metal object.
Use a triangle beater to make circles
along the rim in continuous contact.
sim.
interp. rhythm
5:3
Vln.
III
sempre SP, no vib.
legato - min. bow changes
II
III
Vc.
I
sempre SP, no vib.
legato - min. bow changes
8va
S. D.
train accelerating

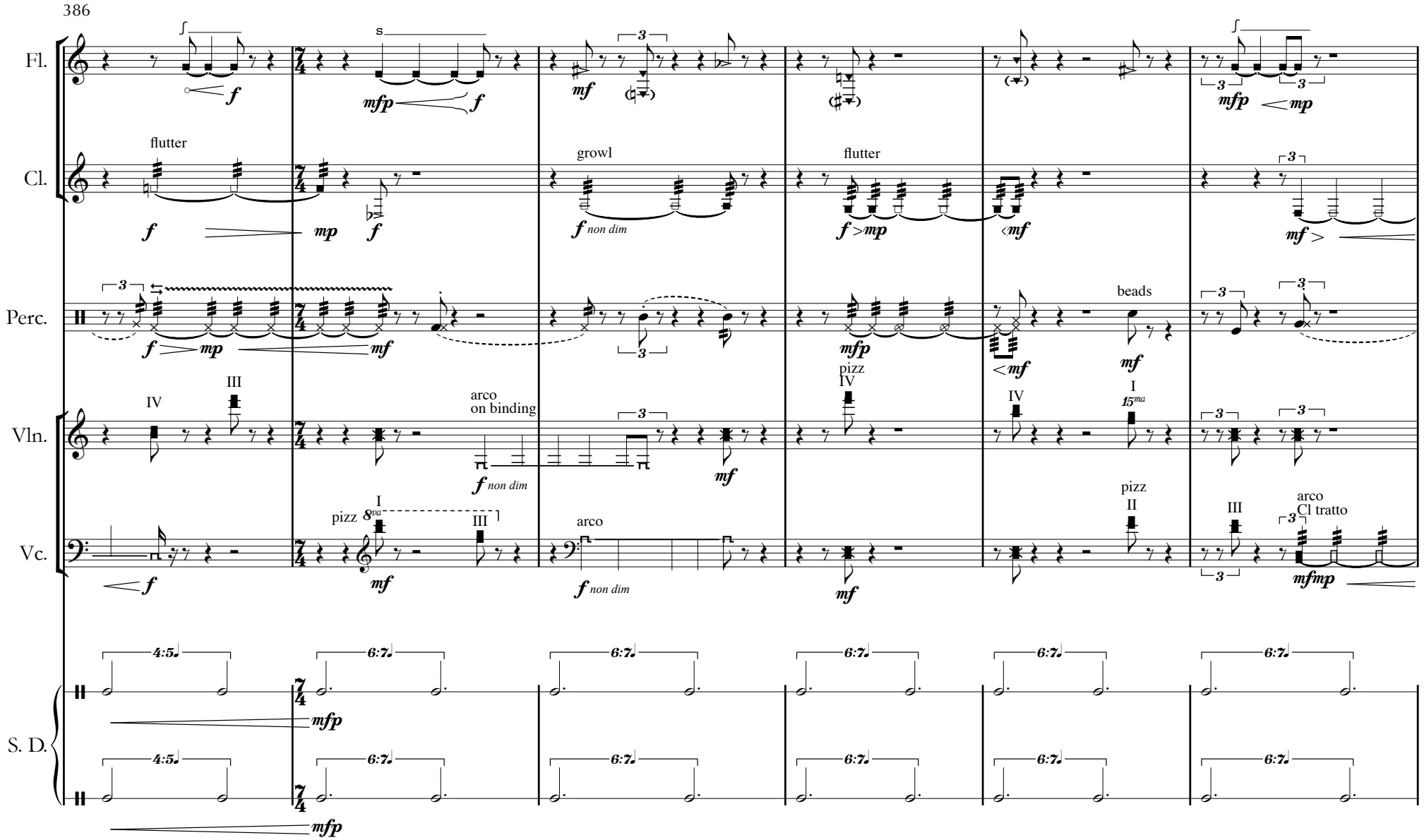

338
P
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
interp. rhythm
texture stick
mallet tip
end
sempre CL Tratto
sempre CL Tratto
trains passing

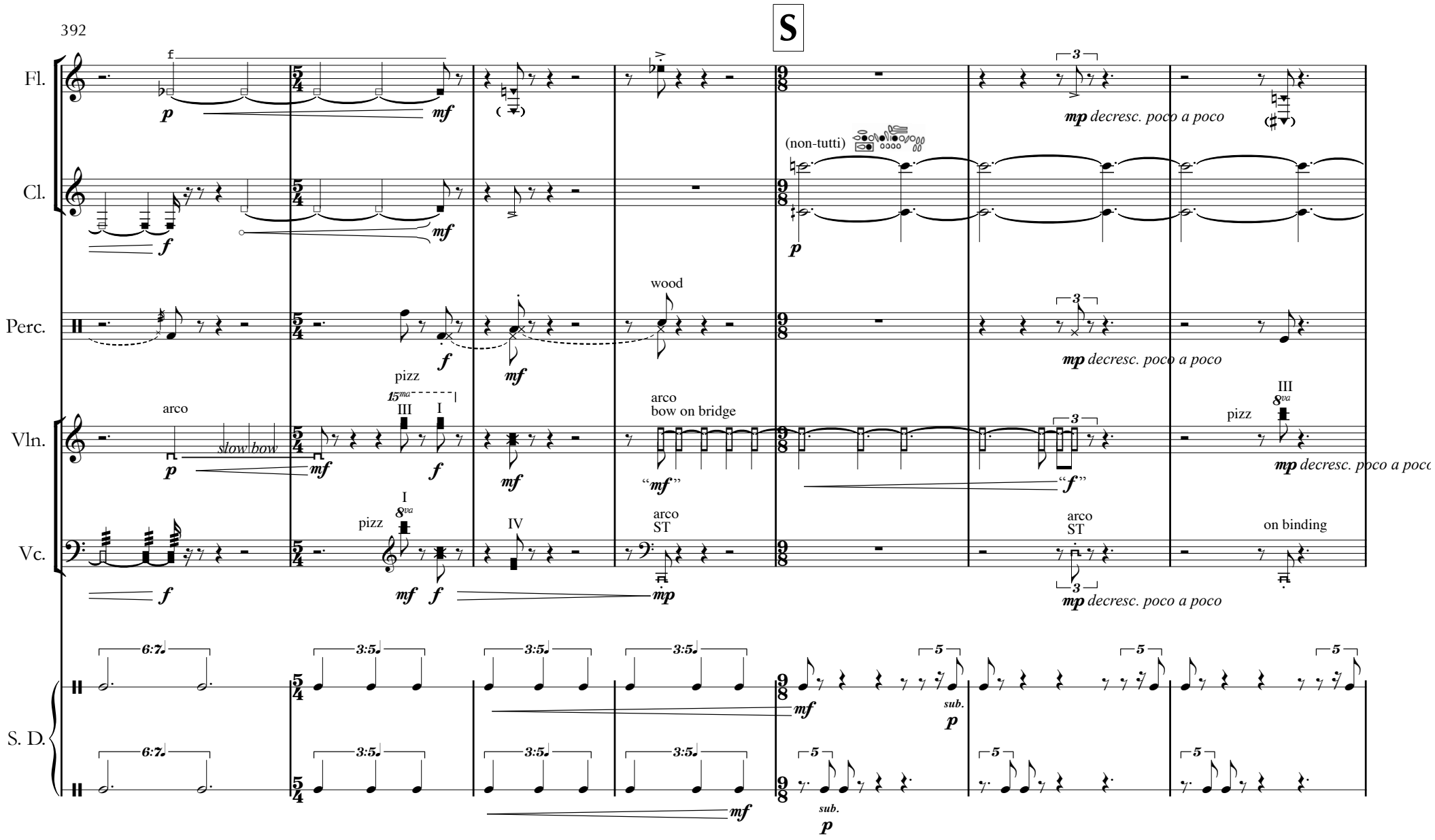

350
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
mallet tip
end
mallet tip
end
sounds of rails on tracks

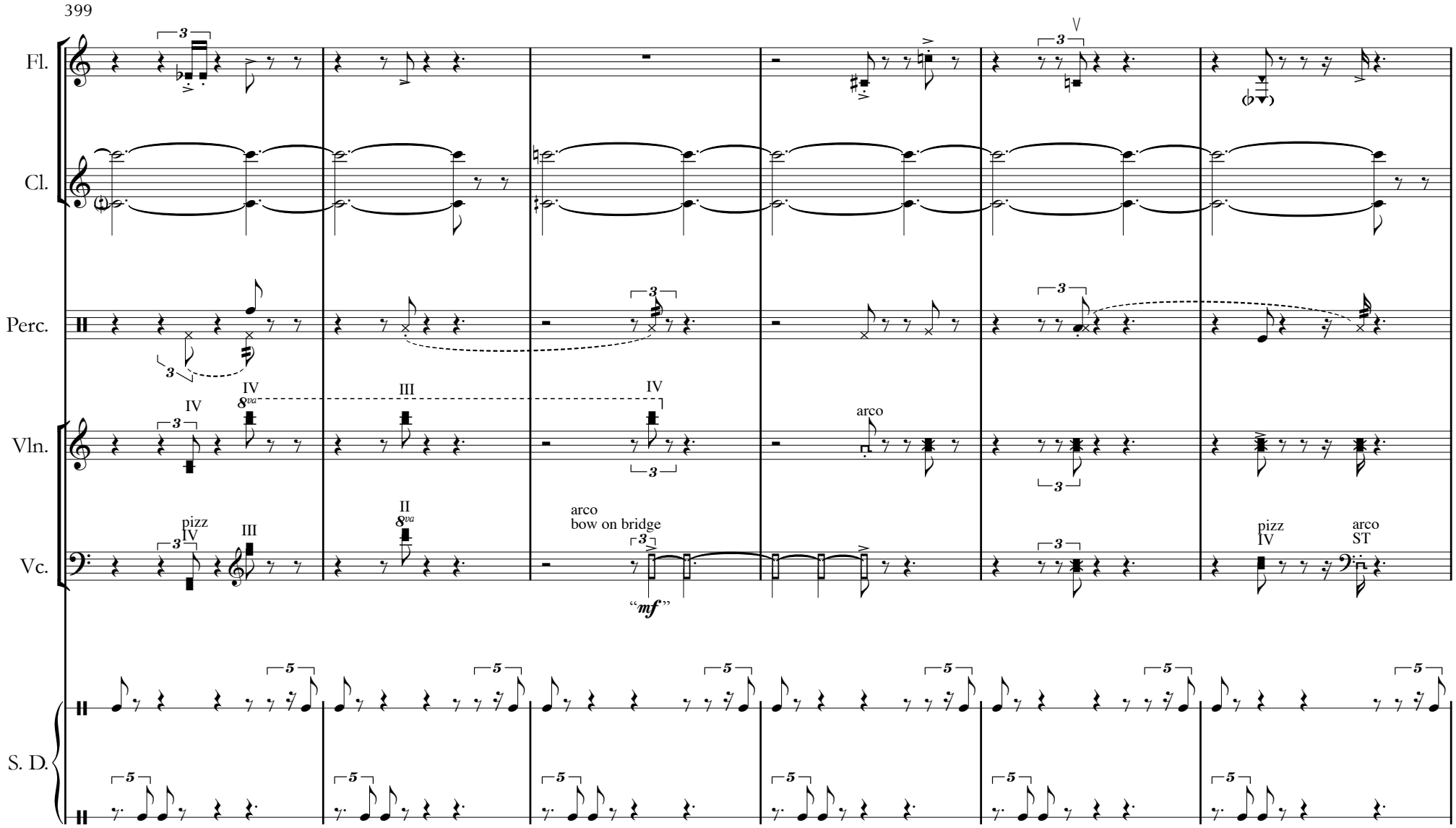

360
Q
Articulate events and the start and end of sustained notes are almost always in rhythmic unison until m. 413
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
growl
flutter
Texture Sticks.
See performance note Q
wood
arco
Cl Batt off the string as fast as possible
pizz
Cl Bat
ST
Cl tratto
sempre accented

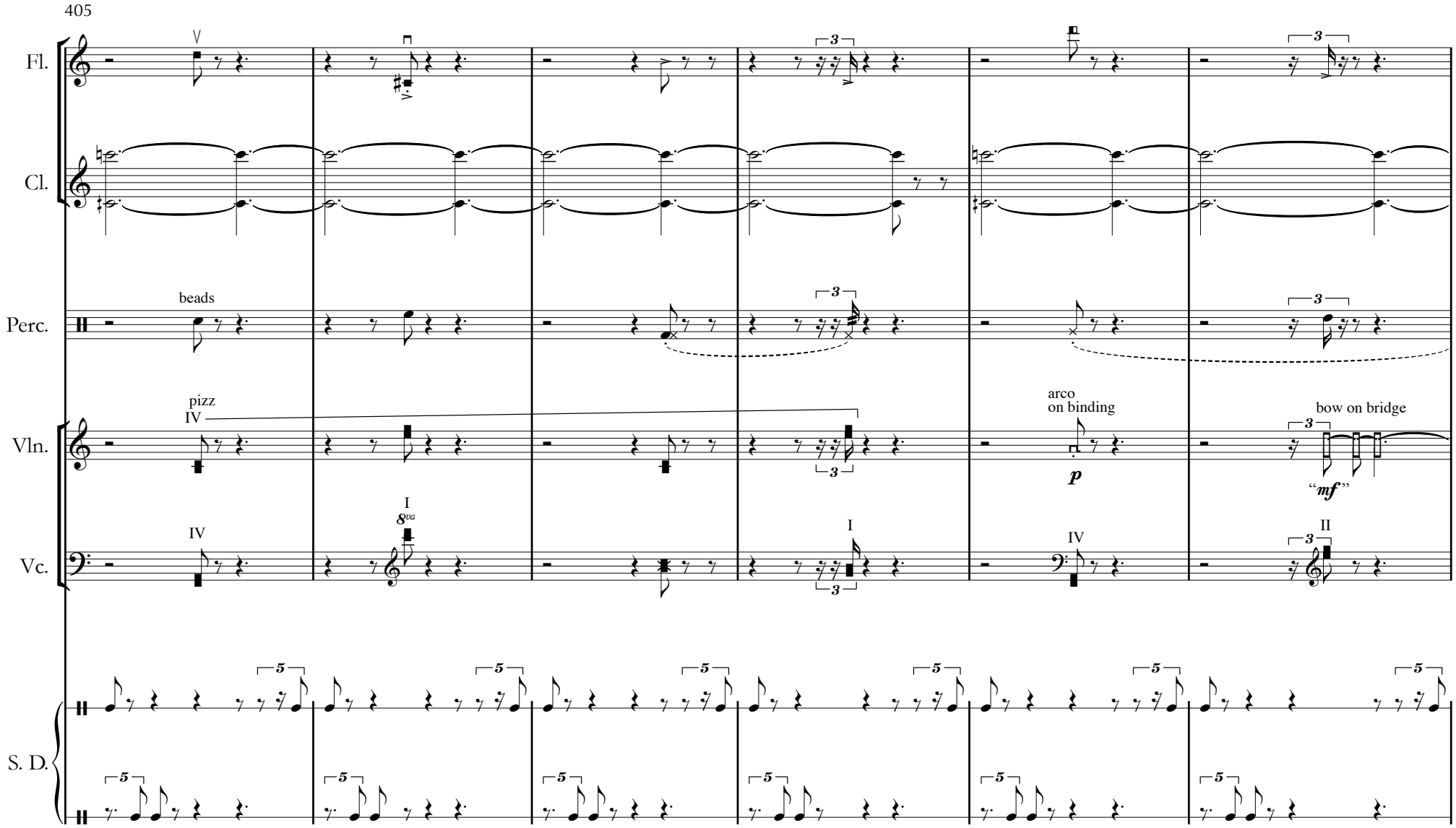

367
R
= 138
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
growl
Double Tongue
beads
ST MST
Cl Bat
Bouncing
pizz
IV
arco
SP
CL tratto
on binding
arco
on
binding
pizz
III
arco CL tratto
pizz
III
IV
3:5:

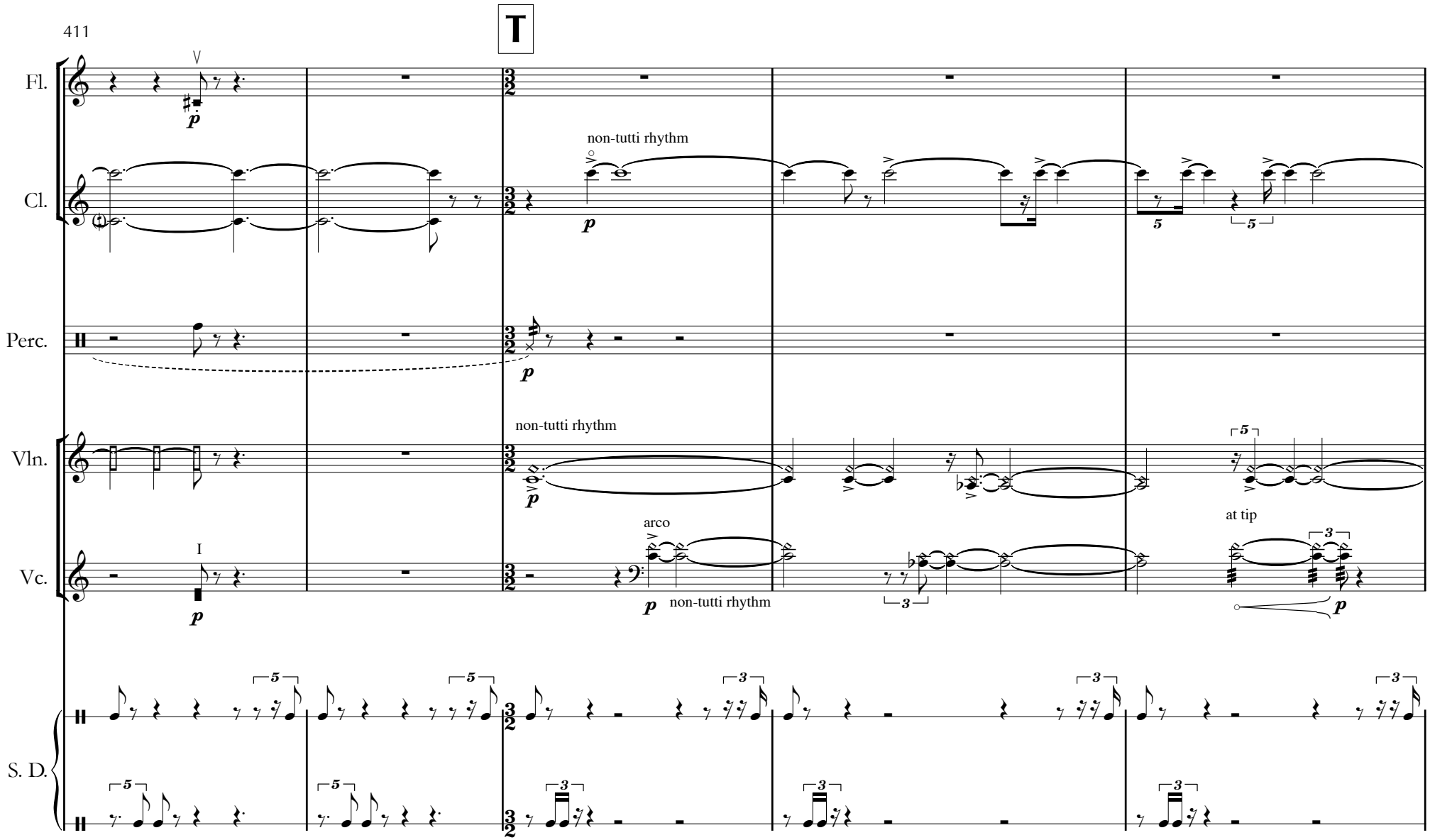

378
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
Double Tongue
beads
wood
pizz
arco
CL Bat
ST
jété
on binding
ST
"mp"

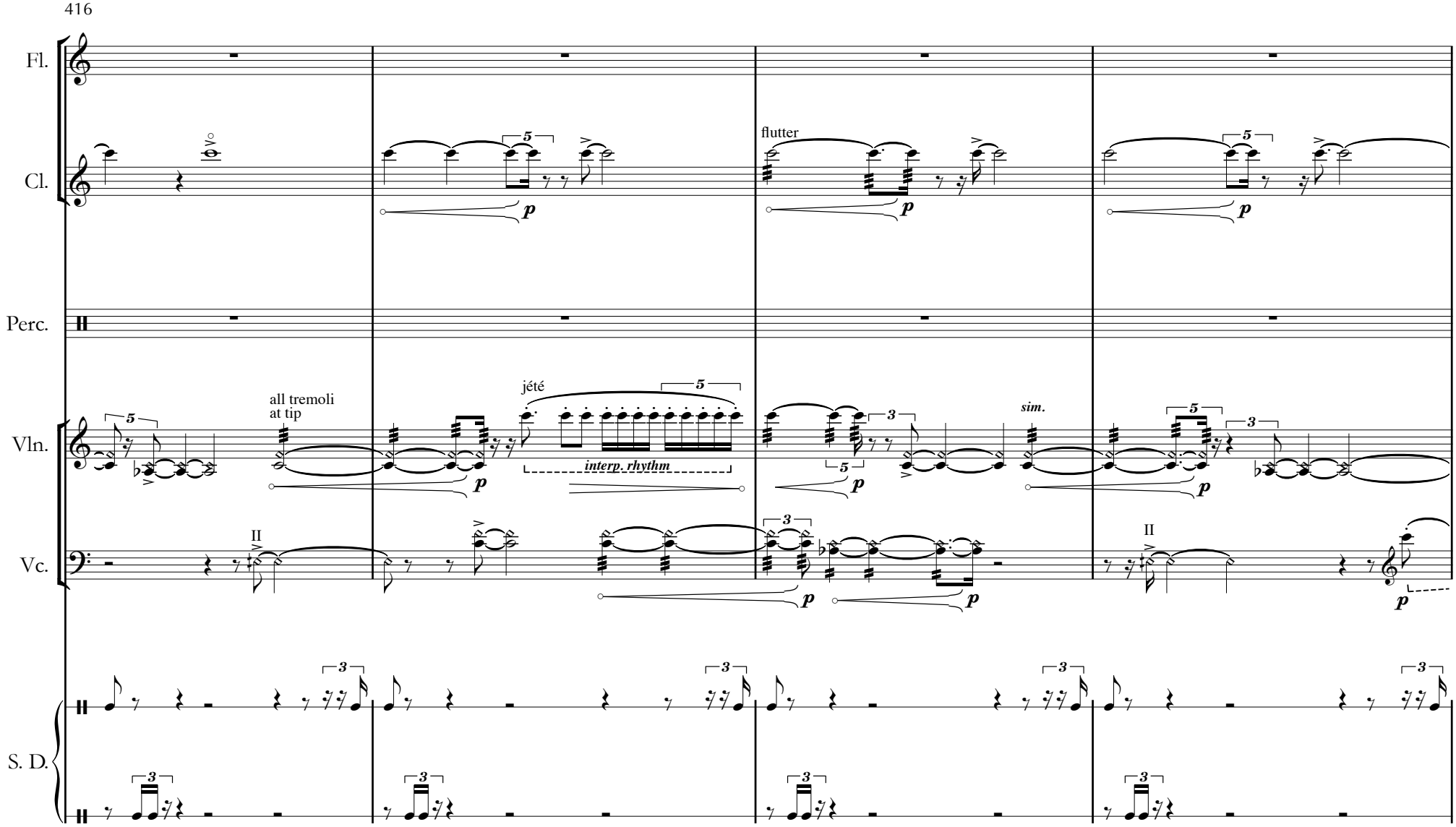

386
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
flutter
growl
flutter
beads
pizz
arco
on binding
non dim
pizz 8va
arco
arco
Cl tratto
4:5
6:7

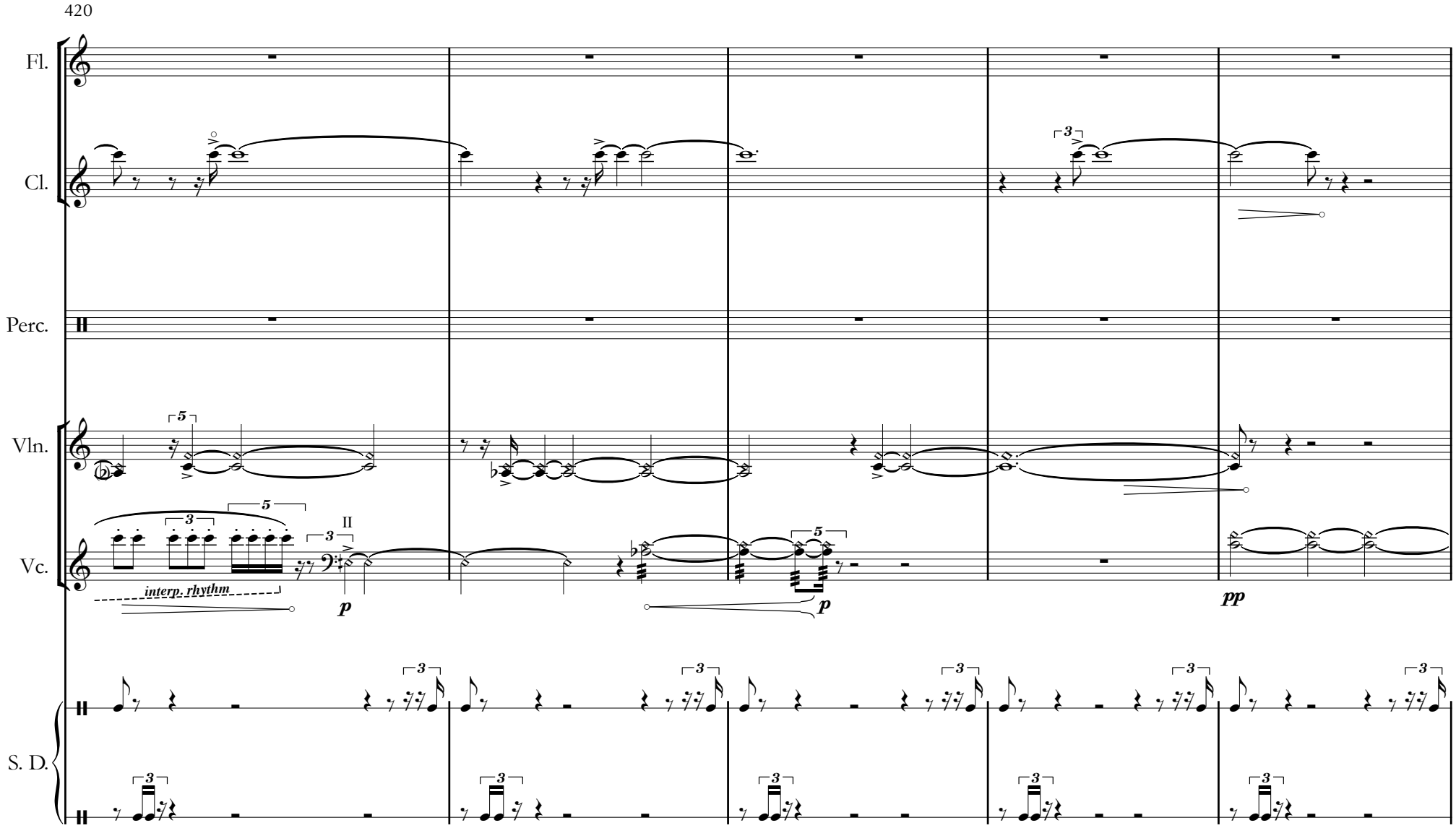

392
S
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
(non-tutti)
wood
arco
slow bow
pizz
15ma
III
I
arco
bow on bridge
pizz
8va
I
IV
arco
ST
arco
ST
III
8va
pizz
on binding
mp decresc. poco a poco
mp decresc. poco a poco
mp decresc. poco a poco
mp decresc. poco a poco
sub.
sub.

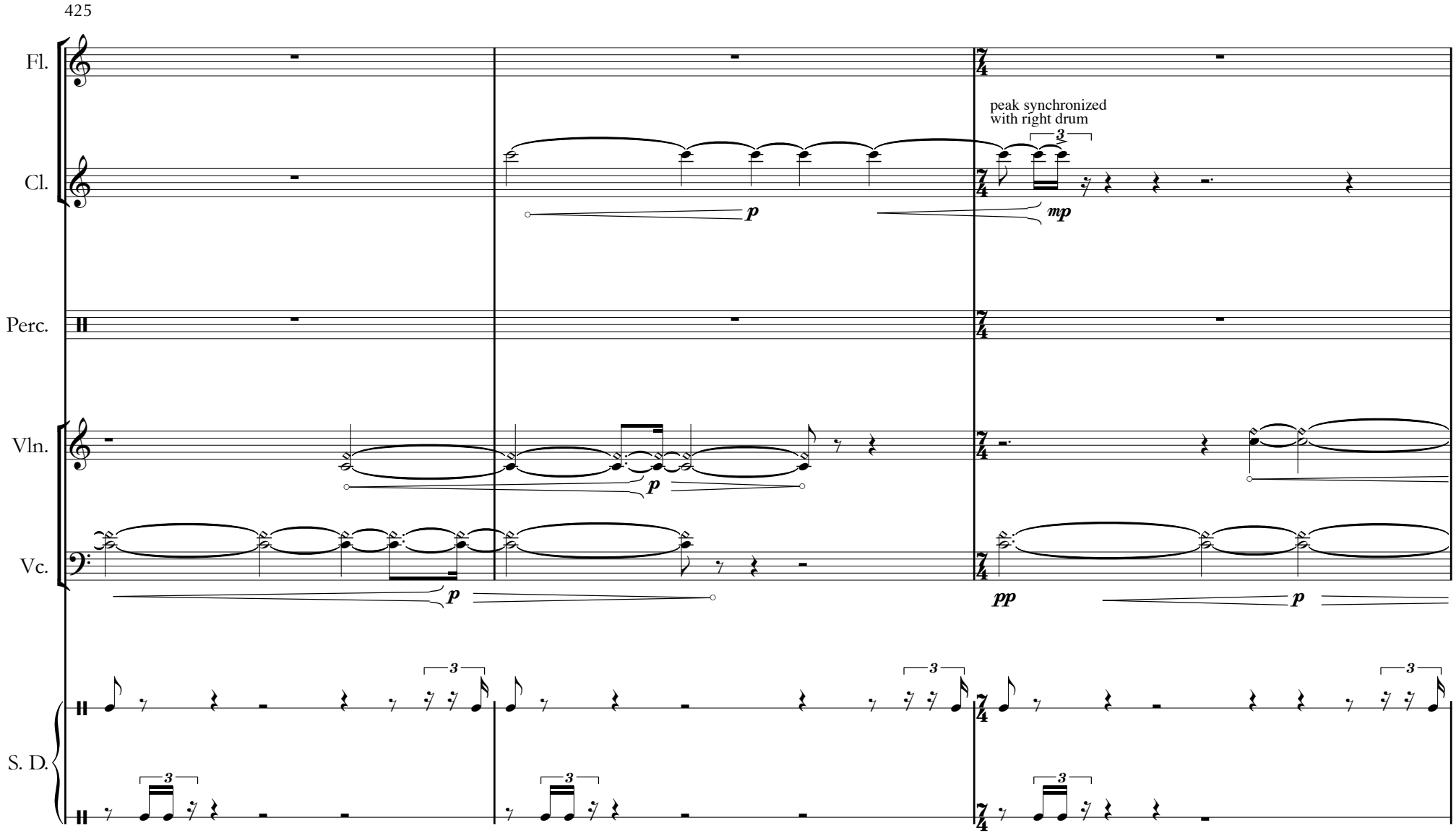

399
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
IV
III
IV
arco
pizz
IV
III
II
arco
bow on bridge
"mf"
pizz
IV
arco
ST

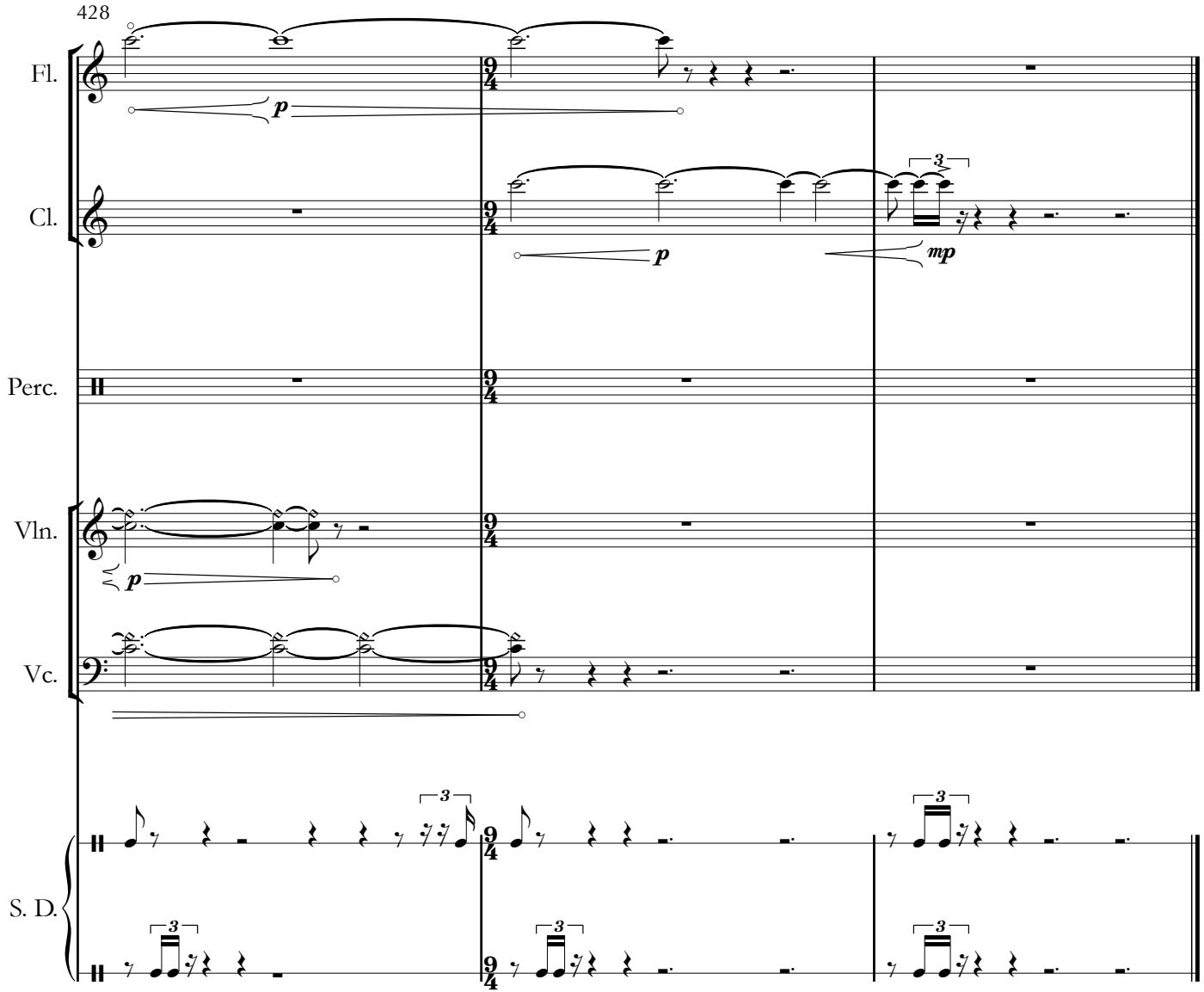

405
Fl.
Cl.
Perc.
beads
Vln.
pizz
IV
arco
on binding
p
bow on bridge
"mf"
Vc.
IV
I
8va
I
IV
II
S. D.


411
T
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
non-tutti rhythm
non-tutti rhythm
arco
non-tutti rhythm
at tip


416
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
flutter
all tremoli
at tip
jété
interp. rhythm
sim.
II
II


420
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
interp. rhythm
II
p
p
pp


425
Fl.
Cl.
Perc.
Vln.
Vc.
S. D.
peak synchronized
with right drum
p
mp
pp
3



28 Feb, 2018
Paris, France / Liverpool, UK